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ANNUAL REPORT OF THE  
SURGEON GENERAL OF THE  
PUBLIC HEALTH SERVICE  
OF THE UNITED STATES

FOR THE FISCAL YEAR

1918



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1918

TREASURY DEPARTMENT,

Document No. 2832

*Public Health Service.*

## LETTER OF TRANSMITTAL.

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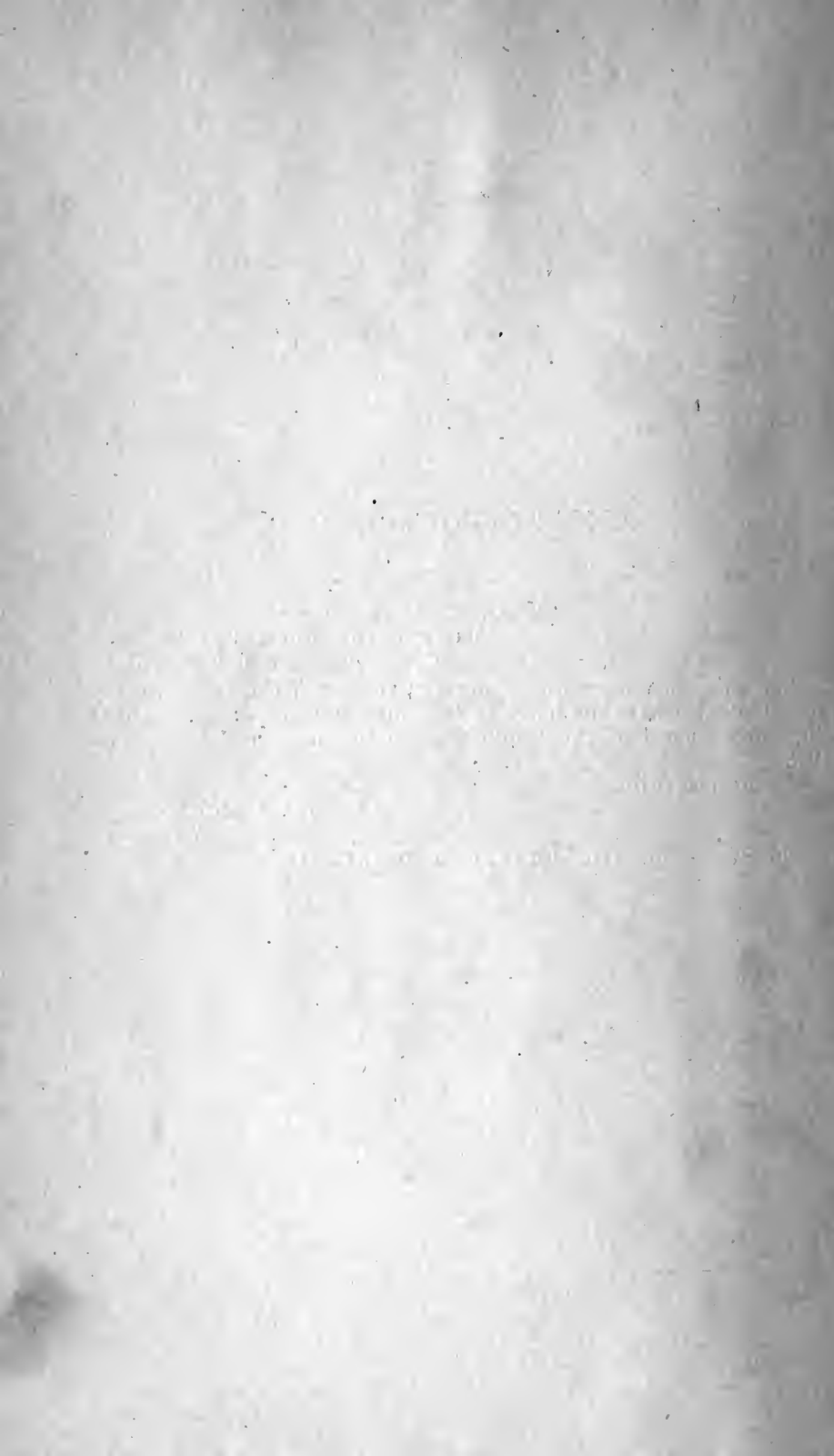
TREASURY DEPARTMENT,  
OFFICE OF THE SECRETARY,  
*Washington, December 2, 1918.*

SIR: In accordance with section 9 of the act of Congress approved July 1, 1902, I have the honor to transmit herewith the report of the Surgeon General of the Public Health Service for the fiscal year 1918.

Respectfully,

W. G. McAdoo,  
*Secretary.*

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.



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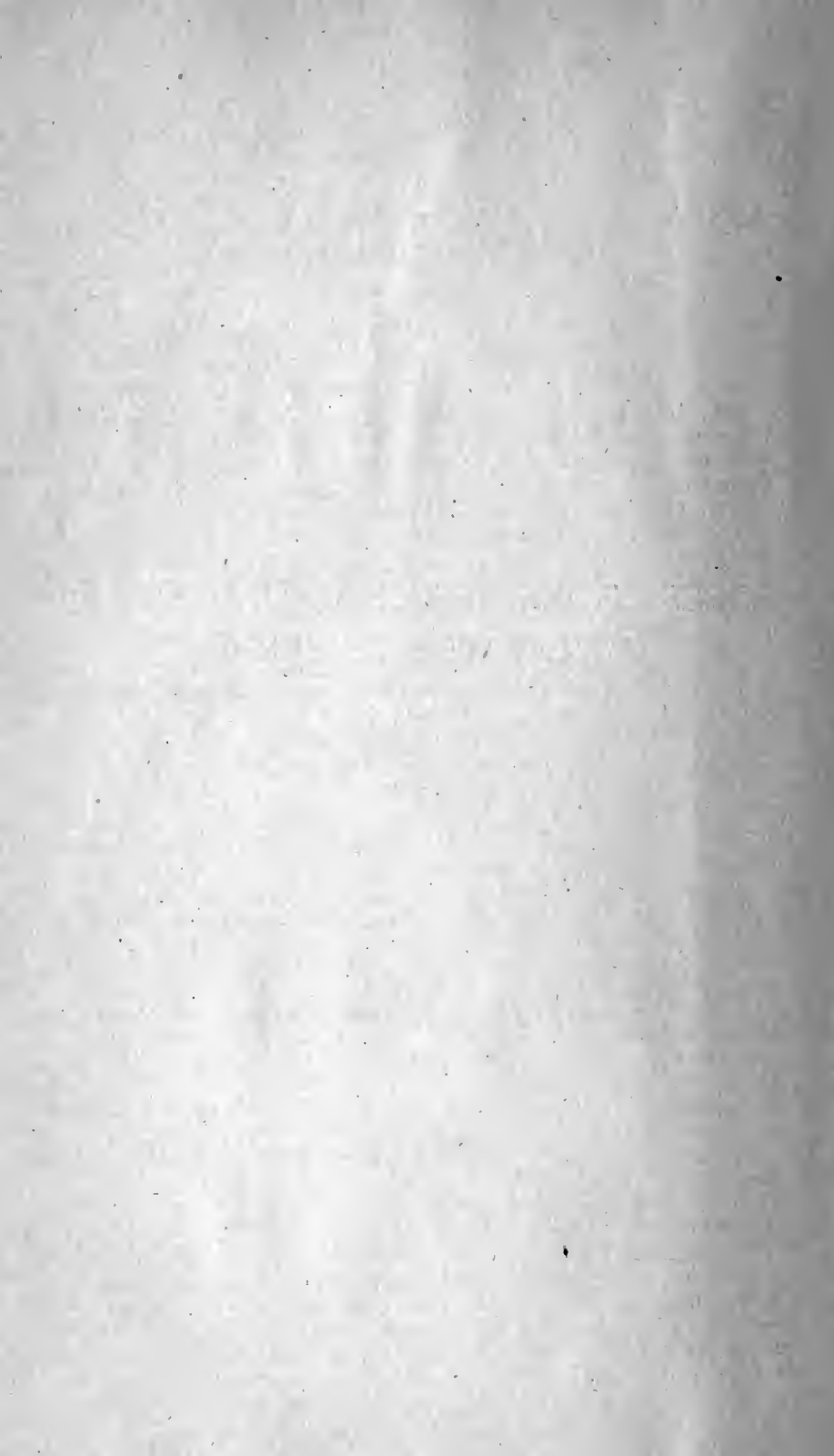
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OPERATIONS OF THE UNITED STATES  
PUBLIC HEALTH SERVICE

1918

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# ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE.

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TREASURY DEPARTMENT,  
BUREAU OF THE PUBLIC HEALTH SERVICE,  
*Washington, D. C., October, 1918.*

SIR: In accordance with the act of July 1, 1902, I have the honor to submit for transmission to Congress the following report of the operations of the Public Health Service for the fiscal year ending June 30, 1918. This is the forty-seventh annual report of the service, covering the one hundred and twentieth year of its existence.

The administrative organization of the bureau during the past fiscal year remained the same as in previous years. The following is a list of the divisions of the bureau through which the field work of the service was conducted during the fiscal year:

- (1) Scientific Research.
- (2) Domestic (Interstate) Quarantine.
- (3) Foreign and Insular (Maritime) Quarantine and Immigration.
- (4) Sanitary Reports and Statistics.
- (5) Marine Hospitals and Relief.
- (6) Personnel and Accounts.
- (7) Miscellaneous Division.

The administrative heads of the service and the chiefs of the bureau divisions at the close of the fiscal year consisted of the following:

Surg. Gen. Rupert Blue.

Asst. Surg. Gen. J. C. Perry, in charge of the Division of Personnel and Accounts.

Asst. Surg. Gen. W. G. Stimpson, in charge of Division of Marine Hospitals and Relief.

Asst. Surg. Gen. J. W. Schereschewsky, in charge of Division of Scientific Research.

Asst. Surg. Gen. A. J. McLaughlin, in charge of Division of Domestic Quarantine.

Asst. Surg. Gen. R. H. Creel, in charge of Division of Foreign and Insular Quarantine and Immigration.

Asst. Surg. Gen. B. S. Warren, in charge of Division of Sanitary Reports and Statistics.

Chief Clerk, Daniel Masterson.

Secretary to Surgeon General, F. Gwynn Gardiner.

During the past year certain functions of the service were administered jointly by two or more of the bureau divisions. An instance which may be cited to illustrate such joint administration is the important work of sanitating the extra-cantonment zones. The sanitation of these areas necessitated the joint utilization of the scientific

and field forces of the Divisions of Scientific Research and Domestic Quarantine in carrying forward this work with a maximum of effectiveness. The Division of Sanitary Reports and Statistics likewise cooperated by compiling statistics of disease prevalent in these areas for the information of the Army and Navy, the Council of National Defense, and State and local health authorities.

Some of the most important developments in the work of the Public Health Service occurred after the expiration of the fiscal year, but as they are of more than passing interest to public-health authorities it is deemed advisable to mention them in this report.

The lack of coordination of Federal public-health activities especially concerned in the prosecution of the existing war caused the President, on July 1, 1918, to promulgate the following Executive order, designed to properly coordinate these various activities under the supervision of the Secretary of the Treasury:

#### EXECUTIVE ORDER.

Whereas, In order to avoid confusion in policies, duplication of effort, and to bring about more effective results, unity of control in the administration of the public health activities of the Federal Government is obviously essential, and has been so recognized by Acts of Congress creating in the Treasury Department a Public Health Service, and specially authorizing such Service "to study the diseases of man and the conditions influencing the propagation and spread thereof" and "to cooperate with and aid state and municipal boards of health:"

Now, therefore, I Woodrow Wilson, President of the United States, by virtue of the authority vested in me as Chief Executive, and by the Act "authorizing the President to coordinate or consolidate executive bureaus; agencies, and offices, and for other purposes, in the interest of economy and the more efficient concentration of the Government" approved May 20, 1918, do hereby order that all sanitary or public health activities carried on by any executive bureau, agency, or office, especially created for or concerned in the prosecution of the existing war, shall be exercised under the supervision and control of the Secretary of the Treasury.

This order shall not be construed as affecting the jurisdiction exercised under authority of existing law by the Surgeon General of the Army, the Surgeon General of the Navy, and the Provost Marshal General in the performance of health functions which are military in character as distinguished from civil public health duties, or as prohibiting investigations by the Bureau of Labor Statistics of vocational diseases, shop sanitation, and hygiene.

WOODROW WILSON.

THE WHITE HOUSE, 1 July, 1918.

By virtue of this order, all civil public health activities carried on by any Federal executive department or agencies especially created for or concerned in the prosecution of the war were placed under the supervision and control of the Treasury Department to be administered through the Public Health Service, and the sanitary work previously conducted by the United States Shipping Board in connection with the maintenance of sanitary conditions in the 170 shipyards was assumed by the Public Health Service. Arrangements have also been completed with a view to having the Public Health Service assume supervision of all medical and sanitary matters in industrial plants having contracts with the Ordnance Department.

Medical supervision is also being exercised over the various Government nitrate plants at Nitro, W. Va.; Muscle Shoals, Ala.; Ancor and Toledo, Ohio; and at the plants located in Nashville, Tenn., and Richmond, Va.

Under the provisions of this order, arrangements have also been made with the Working Conditions Service of the Department of Labor with a view to formulating general sanitary codes for industries to adequately protect the health of workers in these war industries.

After the entrance of the United States into the world war, the need for protecting the military forces of the country from the ravages of venereal diseases soon came to be recognized by all as largely a civilian problem. Statistics show that a far greater number of men are infected before joining the military forces than contract the disease after entering camp. Accordingly, on July 9, Congress gave legal recognition to the need for controlling this disease by enacting legislation in the Army appropriation act of that date which created in the Public Health Service a Division of Venereal Diseases.

Under the authority of this act and the terms of the Executive order of July 1, the organization of the Division of Venereal Diseases was immediately begun, and much of the work hitherto performed by the Commission on Training Camp Activities in reference to venereal diseases was taken over by the Public Health Service. The work of this division was placed in charge of an Assistant Surgeon General of the Public Health Service. The same act also contained provisions for allotting funds to the various States for the purpose of controlling the disease under regulations to be issued by the Secretary of the Treasury. These regulations have been promulgated and funds allotted to the States in compliance with the terms of the law.

A long step forward in national public-health administration was taken on October 27, when the act to establish in the Public Health Service a Sanitary Reserve Corps was signed by the President. The measure reads as follows:

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of securing a reserve for duty in the Public Health Service in time of national emergency there shall be organized, under the direction of the Secretary of the Treasury, under such rules and regulations as the President shall prescribe, a reserve of the Public Health Service. The President alone shall be authorized to appoint and commission as officers in the said reserve such citizens as, upon examination prescribed by the President, shall be found physically, mentally, and morally qualified to hold such commissions, and said commissions shall be in force for a period of five years, unless sooner terminated in the discretion of the President, but commission in said reserve shall not exempt the holder from military or naval service; *Provided*, That the officers commissioned under this Act, none of whom shall have rank above that of assistant surgeon general, shall be distributed in the several grades in the same proportion as now obtains among the commissioned medical officers of the United States Public Health Service and shall at all times be subject to call to active duty by the Surgeon General and when on such active duty shall receive the same pay and allowances as are now provided by law and regulation for the commissioned medical officers in the said regular commissioned medical corps.*

The public-health activities of the country can thus be properly expanded to meet acute situations and coordinated under the direction of the Federal Public Health Service in meeting national emergencies.



## SCIENTIFIC RESEARCH.

As in previous years, laboratory and field investigations of diseases of man and other public health matters have been conducted through the Division of Scientific Research, in charge of Surg. J. W. Kerr (then Assistant Surgeon General) during the first half of the year and of Asst. Surg. Gen. J. W. Schereschewsky during the second half. In cooperation with the Division of Domestic Quarantine, the activities of the Scientific Research Division have also related to the sanitation of extra military areas. These activities are reported in a separate section devoted to the joint work of the two divisions. (See p. 103.)

The laboratory and field investigations have related almost entirely to health problems arising out of the war. They have therefore differed markedly in character from those previously conducted by the division. Special attention has been given to the subject of industrial hygiene, with a view to affording all possible protection to the health of war workers. The work has had the following scope: Sanitary surveys of plants making war materials, sanitary surveys of navy yards, control of malaria at shipbuilding plants, surveys to determine the degree of medical and surgical care given to industrial workers, representation on a subcommittee of the Council of National Defense, which prepared a series of precautions for the protection of workers in the explosives and munitions industries, issuance of circulars urging the vaccination of industrial workers against small-pox and typhoid fever, studies of shop lighting conditions, studies of industrial fatigue, studies of health hazards of chemical industry and health chemical workers, studies of trinitrotoluol poisoning, assumption of the sanitation and the medical and surgical relief at a Federal explosives plant at Nitro, W. Va., studies of mine sanitation, tabulation of data in regard to health insurance, and numerous other activities.

Studies of malaria, rural sanitation, school hygiene, etc., have necessarily been limited principally to work in connection with the extra cantonment zones; but opportunity has been taken to make all scientific studies possible without interfering with the work of the division related more closely to the prosecution of the war. Studies of pellagra, public health administration, pollution of streams and coastal waters, industrial wastes, and sewage disposal were practically discontinued during the year, with the hope that they can be recommenced with renewed energy at the end of the emergency occasioned by the war. Data previously obtained in these investigations have been of constant use in the war activities of the division.

Studies of outbreaks of various diseases, conduct of trachoma hospitals, laboratory work at the Hygienic Laboratory and the leprosy investigation station, and control over the manufacture of biological products have been continued as in previous years. To the greatest

degree possible, studies at the Hygienic Laboratory have related to problems connected with war conditions. More attention than was possible in the past has been paid to supervision over the manufacture and sale of viruses, serums, toxins, and analogous products, in view of the necessity of keeping such products uncontaminated during the present emergency. In cooperation with the Federal Trade Commission, the service assumed supervision over the manufacture of arsephenamine, under which name products similar to salvarsan are being produced.

The importance of public health work as a war measure has impressed itself upon the service in increasing measure. Hardly a problem which has received attention in this division in the past few years has not come up in connection with the protection of the health of the country, in order that troops and supplies may be sent abroad as rapidly as possible and an army maintained in Europe as effectively as possible. In many cases these problems had already been solved and the results were available in this emergency; in other cases field and laboratory studies have been necessary. All activities have been conducted from the point of view of assisting as much as possible in the conduct of the war. They may be classified as follows: Diseases of man (meningitis, diphtheria, dysentery, influenza, jaundice, malaria, pellagra, poliomyelitis, rat bite fever, trachoma, tuberculosis, and typhoid fever), occupational diseases and industrial hygiene, public health organization and administration, school and mental hygiene, rural sanitation, investigation of pollution of streams, pollution of coastal waters, industrial wastes, sewage disposal, cooperation with Bureau of Chemistry, leprosy studies, studies at Hygienic Laboratory, control of biological products, control of manufacture of arsephenamine, conference with State and territorial health authorities, representation at meetings, and dissemination of information.

### CEREBROSPINAL MENINGITIS.

#### CHARLOTTE, N. C.

In cooperation with local health authorities, Passed Asst. Surg. Joseph Bolten investigated the situation in Charlotte, N. C., where an outbreak of cerebrospinal meningitis occurred in January, 1918.

At Camp Greene, near Charlotte, where the epidemic started, 28 cases were treated. The number of cases among the civil population was 17, with 5 fatalities.

The case histories indicated that more than half of the cases were due to contact with soldiers. Carrier cases were isolated at home, and a quarantine established.

#### ALEXANDRIA, LA.

An epidemic cerebrospinal meningitis at Alexandria, La., was investigated by Passed Asst. Surg. Joseph Bolten in January, 1918. 24 cases occurred with 8 deaths.

Examination of the histories of the patients revealed in over 50 per cent of cases, direct contact with soldiers or laborers at Camp Bureaugard, an encampment near Alexandria, where there had also occurred an outbreak of the disease.



No new case developed in Alexandria after the city was quarantined by closing nearly all public places and by preventing communication except by pass, between the city and the camp.

The clinical aspect of the disease differed greatly from that prevailing in South Carolina. In Alexandria, the patients did not appear very ill; they seldom lost consciousness except just before death; with few exceptions, all patients had an eruption with petechiae. Two or more cases per family were quite common. Death occurred in many instances within 36 hours after the illness began. In the South Carolina cases, the patients were exceedingly ill; unconsciousness was a very common symptom; a rash was the exception; two cases in the same family were rare and death did not occur within a short period.

#### SOUTH CAROLINA.

Passed Asst. Surg. Joseph Bolten was detailed in January, 1918, to make a study of outbreaks of cerebrospinal meningitis in the State of South Carolina.

Investigations showed that at least 50 per cent of the cases had been due to contact with cases among soldiers and army laborers, some 100,000 of whom are located in the three military camps of the State.

In every case where lumbar puncture was performed, a bacteriological examination of the spinal fluid was made. In about 65 per cent of the cases, Gram negative intracellular diplococci were found.

#### SAN ANTONIO, TEX.

Asst. Surg. J. H. Linson made a study in February, 1918, of the epidemic of cerebrospinal meningitis among the civil population of San Antonio, where Fort Sam Houston and Camp Travis are located.

Only one carrier was found from a total of 81 cultures taken among civilians. Two and one-half per cent of the troops at Camp Travis were shown by routine examination to be carriers. Out of 23 cases among civilians reported as epidemic cerebrospinal meningitis, 15 died. It appears, however, that many of the cases which recovered were not reported.

Although the evidence was not conclusive, it was found that—

1. The incidence of meningitis was greater among soldiers than among civilians.
2. Children of school age and under were infected more frequently than older individuals of the civil population.
3. Practically all of the cases occurred among the poorer classes.

#### NEWPORT NEWS, VA.

An outbreak of cerebrospinal meningitis occurring in Newport News, Va., Passed Asst. Surg. Joseph Bolten was detailed on December 1, at the request of the State and local health authorities, to make a study of the outbreak. A case had occurred on November 19 in a railroad gang working on the Army reservation and by December 14, 18 cases had occurred in the regiments stationed at New-

port News. Regulations were drawn up for the guidance of the chief sanitary officer with a view to isolating and treating contacts so as to prevent the spread of the disease, and laboratory studies were conducted.

#### LABORATORY INVESTIGATIONS OF CEREBROSPINAL MENINGITIS AT MANHATTAN, KANS.

In connection with an outbreak of cerebrospinal meningitis at Manhattan, Kans., laboratory studies were conducted by Asst. Surg. G. C. Lake from November 27 to December 20, 1917. About 2,000 examinations were successfully made and the number of meningococcus carriers was found to be about 3 per cent. When a carrier was found he was immediately isolated and kept isolated until two negative cultures were obtained. The preventive work was done in connection with the extra cantonment zone authorities, under charge of Senior Surg. C. E. Banks. Assistance in the laboratory work was given by the service laboratory car, under Asst. Surg. Aiken.

#### BEREA, KY.

An investigation of a cerebrospinal meningitis outbreak among the college students at Berea, Ky., was conducted in February, 1918, by Passed Asst. Surg. Paul Preble.

Conferences were held with the college and local authorities and preventive measures including a restricted quarantine of the student body were instituted.

Assistance in the laboratory work was given by the service laboratory car.

#### NORFOLK, VA., AND VICINITY.

Asst. Surg. G. C. Lake was detailed on January 29, 1918, to investigate an outbreak of cerebrospinal meningitis in the civil population at Norfolk, Va., where there is located an important naval base. At the request of the local health authorities, he took charge of the laboratory examinations in connection with the epidemic, making about 250 cultures, which were taken of all suspicious cases. After Dr. Lake's arrival, all cases in Norfolk were treated in the hospital and the homes quarantined. The total number of cases occurring from January 3 to February 26 was 30, with a case fatality of 50 per cent.

The following conclusions were reached:

1. The disease seemed to bear no relation to social conditions.
2. There was a marked dropping off of cases when the weather moderated.
3. A close connection between the civil cases and those at the naval base was noted.
4. The culturing of persons for the detection of carriers and their isolation has little practical value, judging from the limited experience at Norfolk, because: (a) A number of cases occurred in the poorest families where overcrowding was great and conditions for droplet infection ideal, yet in only one instance did two cases develop in the same house; (b) it is practically impossible to establish

an efficient quarantine of carriers in most cities; (c) it is extremely difficult to isolate the carrier.

### DIPHTHERIA.

#### EPIDEMIC AT NEWPORT, R. I.

An outbreak of diphtheria at Newport, R. I., was investigated by Surg. G. W. McCoy and Passed Asst. Surg. Bolten in cooperation with the State and local authorities, the Navy Medical Department, and the Red Cross. Epidemiological studies showed that the epidemic was probably due to infected ice cream. Dr. Bolten assisted in the laboratory work. A large amount of valuable data was secured. During the epidemic 285 cases were reported as occurring in Newport and 80 in nearby communities. A report of this investigation was published in the Public Health Reports for October 26, 1917, and issued as Reprint No. 430.

### DYSENTERY.

#### OUTBREAK IN KENTUCKY.

An outbreak of dysentery in Breathitt County, Ky., was investigated in August, 1917, by Surg. John McMullen. There were reported 30 cases, 13 proving fatal.

Polluted drinking water, the presence of swarms of flies and an entire absence of hygiene were responsible for the spread of the disease.

#### EPIDEMIC IN ARKANSAS AND MISSOURI.

Passed Asst. Surg. Preble was detailed in July, 1917, to investigate an epidemic of dysentery in and near Blytheville, Ark., and was later relieved by Passed Asst. Surg. J. R. Ridlon, who completed the investigation. Epidemiological and laboratory studies were made and advice was given for the control of the disease. The disease is believed to have been widespread in northeastern Arkansas and southeastern Missouri.

### INFLUENZA.

#### EPIDEMIC AMONG INDIANS.

An outbreak of disease among the Indian pupils at Haskell Institute, Lawrence, Kans., was investigated in March, 1918, by Senior Surg. C. E. Banks.

The epidemic proved to be influenza (grippe). It was widespread but was checked in two weeks' time.

#### FEVERS IN SOUTHERN STATES.

Fevers of an undetermined nature were reported during April and May, 1918, at various points from Norfolk to Louisiana. An examination by the service of the records and reports of the physicians who have treated these cases leads to the belief that these fevers were mainly influenza of mild type.

It is possible, however, that all cases reported were not of the same disease.

## JAUNDICE (ACUTE INFECTIOUS).

A paper by Past Asst. Surg. M. H. Neill on the problem of acute infectious jaundice in the United States was published in the Public Health Reports of May 10, 1918, and issued as Reprint No. 466. In this paper the aspects of the disease which are of special interest to sanitarians in the United States were emphasized, the epidemiological problems of the disease outlined, and the procedures for their study by laboratory methods indicated.

## MALARIA.

During the past year, field and other investigations of malaria have been conducted from headquarters at the United States Marine Hospital, New Orleans, La., and in general conformity, in so far as possible, with the planned studies of the past three years.

## PERSONNEL.

The staff engaged in malaria investigations has included Asst. Surg. Gen. H. R. Carter, in immediate supervisory charge during the first part of the year; Passed Asst. Surg. R. C. Derivaux, who has continued to act in temporary charge at administrative headquarters; Asst. Surg. L. L. Williams, jr.; Senior Sanitary Engineer J. A. A. Le Prince; Biologist M. B. Mitzmain; Assistant Epidemiologist T. H. D. Griffiths; Assistant Epidemiologist J. C. Geiger; Sanitary Engineer H. W. Van Hovenberg; Assistant Sanitary Engineer C. P. Rhynus; Assistant Sanitary Engineer Sol Pincus; two clerks, one microscopist and one attendant. Additional engineers and other officers have also been given training in the practical application of control measures and assigned to various cantonment and other zones.

## GENERAL ACTIVITIES.

In view of the existence of a state of war, an extensive and comprehensive program of studies which included the more important laboratory and broader epidemiologic aspects of malaria was of necessity discontinued, and the staff engaged in investigations of this character was assigned to field duties in supervision of intensive control operations at extra cantonment zones and other points of increased and immediate importance to the national defense.

For the purpose of increasing the efficiency and attaining a higher degree of uniformity of procedure in malaria control operations at the several cantonment and other zones of military importance in the United States, Asst. Surg. Gen. Carter assumed immediate supervision of activities in the States of Kentucky, Maryland, and Virginia; to Passed Asst. Surg. Derivaux were assigned the cantonments, aviation fields, etc., in southern Louisiana, Mississippi, and Texas; to Senior Sanitary Engineer Le Prince were assigned similar regions of importance in the central and eastern Southern States and, in addition, consulting supervision of all matters of special engineering nature at other points. Special missions of investigation, including survey of localities where shipbuilding, munition production, and other essential industrial enterprises have been established, have also been engaged in by various officers from time to time.

Other activities carried on in connection with malaria investigations during the year have included field surveys at various places, collection of morbidity and other data referring to the prevalence and geographic distribution of malaria, laboratory and biologic studies, and educational demonstrations and lectures. Such field works as have been possible have been carried on as heretofore in intimate and harmonious cooperation with State and local health and other officials; a second unit of intensive demonstration of malaria control by mosquito reduction measures carried on at Hamburg, Ark., by the International Health Board, was also periodically observed in accordance with the request of the board.

#### SURVEYS

In conformity with requests received from local health authorities and other officials and for reasons of special study, visits of survey were made to a number of points in the Southern States. In connection with many of these, educational lectures and demonstrations were given; detailed recommendations for the correction of existing conditions favorable to the prevalence of malaria were also presented to the local health officials for their information. The following is a summary list of the places visited in connection with activities engaged in under the supervision of headquarters at New Orleans. No note is made in this list of the various cantonment and other military zones of which survey has been made and where control operations are in progress. These are reported under the heading "Sanitation of extra cantonment areas" (pp. 103-160).

Arkansas: Crossett, Hamburg, Lake Village, Little Rock, Varner, Tucker, Pine Bluff, Dermott, and McGehee.

Georgia: Savannah.

Louisiana: Crowley, Lake Charles and Gerstner Field, Alexandria, Monroe, and vicinity.

Mississippi: Gulfport, Biloxi, Pass Christian, etc., Hattiesburg, and Greenville.

Missouri: Crystal City and Festus.

South Carolina: Greenville, Columbia, and Spartanburg.

Texas: Orange, Marlin, Waxahachie, Dallas, Sherman, Waco, Houston, Tyler, Lufkin, Keltys, Texarkana, Wildhurst, San Antonio, Fort Worth, and Wichita Falls.

#### DEMONSTRATION WORK.

No new demonstrations of applied malaria control have been undertaken during the past year at points other than extra cantonment zones and, because of the necessity for intensification of effort in this latter connection, it has been possible to revisit but a few of the civil localities where demonstrations have been instituted under the supervision of the service during the past few years. It has been ascertained, however, that good results continue to be obtained at Roanoke Rapids, N. C.; Electric Mills, Miss.; Dallas, Tex.; Marlin, Tex., and Bastrop, Tex.

*Crystal City, Mo.*—As previously reported, active malaria control operations were undertaken at Crystal City and Festus, Mo., in 1916, following preliminary survey and in accordance with recommendations by the service in December of the preceeding year. Control operations have since been continued and, as reported in the Annual Report of 1917, excellent results are being obtained; the second year

of control was found to have been obtained at a per capita cost of 54 cents, in marked and gratifying contrast to the cost of the first year's work of 90 cents per capita.

*Crossett, Ark.*—As detailed in last year's Annual Report, an intensive demonstration study of malaria control by the application of mosquito reduction measures was carried on at Crossett, Ark., by this service in cooperation with the International Health Board during 1916. Upon the completion of the first year's demonstration work, necessary appropriations were made by the city of Crossett and the Crossett Lumber Co., in accordance with recommendations presented, and the control activities have been since continued by the town authorities, under the advisory supervision during 1917 of representatives of the service and of the International Health Board; the same measures of drainage, filling, and the supplemental use of oil were employed as during the previous year's intensive work.

The results obtained in Crossett during 1917 have been highly satisfactory, a further reduction being obtained, as ascertained by comparison of the total number of cases of malaria occurring in this year and in the previous year of 1916, of 85.5 per cent. The reduction as determined by comparison of the total professional visits for malaria between 1916 and 1917 is 75 per cent: as determined by comparison of the total professional calls for malaria in 1915 (the year before anti-malaria work was begun) and 1917 (after two successive years of malaria control work) is 92 per cent. The monthly distribution of the visits for malaria during the three successive years is as follows:

*Calls for malaria, Crossett, Ark.*

	1915	1916	1917		1915	1916	1917
January.....	45	40	6	August.....	350	91	33
February.....	45	39	7	September.....	500	56	22
March.....	50	59	13	October.....	600	46	14
April.....	60	81	12	November.....	350	20	23
May.....	80	114	31	December.....	100	4	15
June.....	20	98	15				
July.....	200	95	9	Total.....	2,502	743	200

In the following summary table are exhibited the total and per capita costs of the first and second year of control work in their relation to the reduction of malaria:

*Reduction in malaria at Crossett and its costs.*

	1916	1917
Total cost of control operations.....	\$2,506.40	\$1,275.45
Total population (May, 1916).....	2,029	
Per capita cost.....	\$1.23½	\$0.63
Per family cost (average).....	\$5.31	\$2.71
Reduction in incidence of malaria as ascertained by repeated parasite indexes (1916)..... per cent.	72.33	
Reduction as determined by comparison of total cases of malaria, 1916 and 1917..... per cent.		85.5
Reduction as determined by comparison of cases occurring in May (maximum) 1916 and 1917..... per cent.		83.7
Reduction as determined by comparison of total professional visits, 1915, 1916 and 1917..... per cent.	70.39	73.07
Gross reduction in total calls, 1915 and 1917..... per cent.		92.0

*Hamburg, Ark.*—Pursuant to a request received from the International Health Board, cooperative supervision was continued with reference to a second point of demonstration of malaria control through activities similar to those employed in the intensive study at Crossett of the year before and consisting of drainage, filling, oiling, etc. This demonstration was conducted under the immediate auspices of the International Health Board and under the personal direction of its representative, Dr. H. A. Taylor, occasional visits of survey being made by the Service to advise with reference to supervision and to follow the progress of operations. As at Crossett, the results of control measures were manifested early in the season and a very pronounced reduction in the local incidence of malaria obtained. The extent of the control operations and their costs is given in the following table:

*General summary of control operations.*

Old streams and ditches cleared and regraded.....	linear yards..	14, 780
Street ditches cleared and regraded.....	do.....	3, 702
Oil used.....	gallons..	755

The total costs of these operations were \$1,861.75, which, with reference to a total population of 1,285 as established by special census, are equivalent to a per capita cost of \$1.45. The results obtained as determined by endemic index blood examinations are shown in the following table:

*Comparative findings, first and second parasite indexes.*

	White.	Colored.	Total.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
First index, May, 1917.....	10. 49	17. 62	13. 11
Second index, December, 1917.....	4. 57	5. 46	4. 95
Reduction.....	56. 44	69. 02	62. 25

As determined by comparison of the total reported physicians' visits for malaria during 1917 with the estimated total of similar calls in 1916, a reduction of 86 per cent is noted; by comparison of the total reported visits for malaria in Hamburg in 1917 with those made by the same physicians in the county immediately adjacent (outside of the influence of the total protective operations), it was found that, for the entire calendar year 35.3 per cent for malaria were made in the county, and, for the period between June 1, 1917, and December 31, 1917 (the "active" malaria season), the excess in county calls was 80.93 per cent.

The general results obtained in this demonstration and their relation to population and costs are given in summary in the following table:

*Malaria reduction and distributed costs.*

Total costs of control operations.....	\$1, 861. 75
Total population (sanitary census, April, 1917).....	1, 285
Per capita cost.....	\$1. 45
Per family cost, average.....	\$6. 18½
Reduction in incidence of endemic malaria (as ascertained by repeated parasite indexes).....	per cent-- 62. 25

Approximate reduction of malaria (as ascertained by comparison of reported total visits for malaria in 1917 and estimated total for 1916)-----per cent..	88
Excess of total reported visits for malaria in county over those in Hamburg in 1917-----per cent..	36.3
Excess of reported visits in county between June 1 and December 31, 1917-----per cent..	80.93

*Control demonstrations in cooperation with the St. Louis & Southwestern Railroad.*—During 1916 steps were taken by the St. Louis & Southwestern Railroad to undertake measures for the control of what has been observed to be an undue incidence of malaria among its employees. It had been found that during the preceding four years about 25 per cent of all admissions to hospital at Texarkana had been for malaria, an annual average of 640 cases having been treated for about five days each; this was equivalent to about 4 per cent of a total of about 15,000 employees and did not include such cases as were treated by local surgeons. A fund was created for the purpose of instituting appropriate control measures, which were begun by representatives of the Public Health Service at the request of and in cooperation with the railroad officials. A preliminary survey was made of the Southern division of the system, and decision reached that the greatest gain would be obtained by concentration of effort in intensified demonstrations at a few selected points. Accordingly, active measures for the control of Anopheles production were begun at Tyler, Lufkin, and Keltys, Tex., early in 1917, under the supervision of Asst. Surg. Williams and Senior Sanitary Engineer Le Prince. Sanitary Engineer H. W. Van Hovenberg was later appointed by the railroad to assume the direction of their sanitary program, and the control works begun by representatives of the service were continued and extended under his supervision, to include Texarkana and Wildhurst. The results obtained as reflected in the hospital records may be briefly summarized as follows:

*Cases of malaria admitted to hospital at Texarkana from certain points under control.*

	1916	1917
Tyler.....	21	10
Texarkana.....	11	3
Total.....	32	13

<sup>1</sup> Decrease 59.4 per cent.

A significant feature of interest at Tyler, Tex., is that between 1916 and 1917 the sale of physicians' prescriptions containing quinine was decreased about 49 per cent.

For the protection of bridge and building outfits, whose duties require continuous changes of base, protection was afforded through the screening of their bunk cars; among these men a reduction of 47.7 per cent was obtained in the number of cases occurring during 1917 in contrast with that of the previous year.

Of particular interest are the results obtained at Keltys, Tex., a small lumber community where malaria had formerly been severe; after one year of work directed against mosquito production, practically no malaria occurred. The mill is stated to have shipped 20 per cent more lumber than ever before, and the manager states that



had malaria prevailed to the same degree as it had in 1916, the mill would have been closed about one-half the time. The net result of this to the Cotton Belt Railroad would have been a freight loss of about \$30,000 during the months of July, August, September, and October.

The organized malaria control activities instituted by the Cotton Belt Railroad are in continued force and have been considerably amplified. In April, 1918, it was found necessary to detach Sanitary Engineer Van Hovenberg from supervision of these activities for duty in extra cantonment malaria control, and a successor has been appointed by whom the works are to be continued; it is expected to intensify features of education and especially to extend protection to those groups of employees the nature of whose occupations preclude the possibilities of using anopheles control methods exclusively.

#### SCIENTIFIC STUDIES.

As stated in the beginning of this report, practically all formal investigative work was discontinued during the fiscal year, with a few exceptions, notably studies in progress at Monroe, La., where a field laboratory had been established. Here Biologist Mitzmain was engaged in investigation of the habits of *Anopheles punctipennis* and *A. quadrimaculatus* with reference to house invasion and selection of breeding places and found further evidence that *Anopheles quadrimaculatus* predominated inside dwellings while *Anopheles punctipennis* were more constantly taken from animal quarters and outhouses. Field dissection of wild mosquitoes, including *Anopheles quadrimaculatus* and *A. crucians* were carried on with a view of determining relative numbers infected. For this purpose mosquitoes were collected in and about the houses of a lumber mill community situated about 6 miles north of Monroe, La., where malaria is stated to have been quite prevalent. Between August 21 and September 4, 1917, about 2 per cent of the insects mentioned showed evidence of infection and infections were found only in *Anopheles quadrimaculatus*. Investigations were also carried on to determine the effects of low temperature of the phenomenon of flagellation of gametes in the mosquito and of the effects of quinine on the morphology of parasites in cases under treatment. During the year instruction has also been given to microscopists and others in the technique of blood examinations for diagnosis of malaria.

In connection with the applied control measures in the extra cantonment zones, etc., experimental study is being made of various methods and appliances useful in mosquito reduction work; these include tests of ditching machines, vertical drains, various methods for oil application, and, more especially, differential cost determinations; these studies are of the greatest importance and it is anticipated that there will shortly be available an extensive mass of information with reference to costs of practical malaria control work which should be most useful in connection with the extension of similar sanitary works in the future.

#### MALARIA INDEX AND OTHER BLOOD EXAMINATIONS.

Routine examinations of series of blood smears for the determination of the endemic parasite index were carried on in the laboratory

at New Orleans, La., until the discontinuance of works of this character because of war conditions. In addition to routine examinations several special series of blood smears were collected at penal institutions by Biologist M. B. Mitzmain for a study of certain of the phenomena of change in the winter index.

The results obtained in routine serial examinations during the year are as follows:

Crowley, La., 417 examined, 5 infected, 1.19 per cent; Sherman, Tex., 495 examined, 18 infected, 3.63 per cent.

In addition to the foregoing 233 miscellaneous preparations received from physicians and others were examined, of which 31 were positive. Since the beginning of routine index determination in 1912 there have been collected to date 27,542 blood smears, of which number 3,344, or 12.14 per cent, were found to contain parasites; this represents an approximation of the endemic index for the southern United States generally. In connection with the treatment of cases of malaria in hospital at New Orleans, La., 172 special examinations were made, of which 38 showed the presence of parasites.

#### STUDIES WITH REFERENCE TO RICE CULTURE AND ITS RELATION TO MALARIA.

Rice field studies, as indicated in the last annual report, were begun at Crowley and Lake Charles, La., by assistant Epidemiologist J. C. Geiger. This investigation was discontinued a very short time after it had been begun because of the need for Dr. Geiger's services in extra cantonment sanitation. With the establishment of an aviation school at Lonoke, Ark., a section where rice culture forms one of the principal industries, the problem of protection of the military personnel at the flying field necessitated continued investigations of certain phases of rice culture. This work is still in progress.

#### EDUCATIONAL MEASURES.

In connection with field surveys, missions of special investigations, and control operations, lectures and educational demonstrations, with reference to malaria and its prevention have been given as during previous years. It is believed that substantial gains are being made in the dissemination of popular information with reference to malaria, and that a public appreciation of the desirability of its control is more commonly met with than has been formerly the case. In addition to the lectures and explanation referred to, educational propaganda by means of newspaper articles and bulletins has also been carried on.

#### PELLAGRA.

At the close of the fiscal year 1917 the following field investigations of pellagra, under the direction of Surg. Joseph Goldberger, were under way:

1. A study of the preventability of pellagra by diet.
2. A study of factors influencing pellagra prevalence in selected cotton-mill villages.

As in the past, special studies of the disease were conducted at Spartanburg, S. C.

## PREVENTABILITY OF PELLAGRA BY PROPER DIET.

The study of the preventability of pellagra begun in the latter part of 1914 was carried on at orphanages and at an asylum for insane for two years. At the end of this period the results, as mentioned in the last annual report, so clearly showed that pellagra could be completely prevented by an appropriate diet that it was deemed unnecessary to continue the study at the orphanages any longer. By reason, however, of the greater significance likely to be attached to the results of studies of pellagra in the insane, the study at the asylum was continued. By the end of December, 1917, the third year of this study was completed, with results in strict harmony with those of the preceding two years, namely, no recurrences and no new cases. The demonstration being clear and complete, the study was discontinued on December 31, 1917. As, however, it was deemed desirable to study the preventive value of single foods and as the conditions at this institution seemed sufficiently favorable to justify the attempt such study was begun on January 1, 1918, with Dr. W. F. Tanner in immediate charge, and is still in progress at the close of the present fiscal year. The indications point to interesting and practically valuable results.

## FACTORS INFLUENCING PELLAGRA PREVALENCE.

The study of factors influencing pellagra prevalence in cotton-mill villages, which was begun in the spring of 1916, was continued on a greatly enlarged scale during the calendar year 1917. A population of nearly 25,000 people in 24 villages was studied for pellagra prevalence, economic status, diet, food availability, and sanitation.

The collection of field data was completed by January 1, 1918. Since then the large mass of records has been worked over preparatory to tabulation and analysis.

A supplemental study of pellagra prevalence in six of the villages presenting special points of interest has been continued and is still in progress.

In connection with this and to supplement the previous year's study a record of the food supply of the families in one of these villages was begun about March 1, 1918, and is still in progress. This, it is expected, will permit of a more precise determination of the relation of seasonal diet and pellagra prevalence than would otherwise be possible.

The tabulation and analysis of the field data collected during 1916 are practically completed. Reports on this part of the investigation are in preparation.

## SPECIAL STUDIES OF PELLAGRA AT SPARTANBURG, S. C.

The special studies of pellagra were continued at the United States Pellagra Hospital, Spartanburg, S. C., during the year.

*Personnel.*—The entire work of the station has continued under the general supervision of Surg. Joseph Goldberger. Passed Asst. Surg. R. M. Grimm continued in immediate charge until relieved by Passed Asst. Surg. G. A. Kempf on July 18, 1917.

Asst. Surg. Waring and Pharmacist L. G. Smith were on duty at the station throughout the year.

The laboratory personnel consisted of Biochemist M. X. Sullivan and Food Analyst K. K. Jones throughout the year; Assistant Biochemist Paul Dawson until August 23, 1917. Physiological Chemist R. E. Stanton continued on duty until December 10, 1917, and was re-appointed June 13, 1918. Dietitian M. Maude Fauquier has continued on duty throughout the year.

*Clinical studies.*—The established method of dietary treatment was continued throughout the year. Drugs were used only to a limited extent for the treatment of several cases of malaria and hookworm infection.

The dietary treatment consists of a standard diet for the convalescents. All acute cases require special diet for the individual case for a time at least. Quantitative records of the consumption of the various foods are kept and are made a part of the record. The routine physical examinations and clinical laboratory studies are made a part of the record of each patient. Semiweekly clinical notes and weighings have been continued.

The treatment of the out-patients was followed as was reported during 1916. One well-balanced meal was served at noon each day. All new cases admitted showed mild clinical symptoms of pellagra. Some cases were continued over from last year. No case showed a recurrence while eating here.

The following tables give the information concerning the number of patients treated and the results:

*Hospital patients.*

	Number.
Under treatment at the beginning of the year.....	24
Admitted to hospital during the year.....	133
Former hospital patients readmitted during the year.....	19
Total hospital patients treated during the year.....	176
Discharged from the hospital during the year.....	148
Remaining in the hospital June 30, 1918.....	28
Days hospital relief furnished during the year.....	7,402

*Out patients.*

	Number.
Under treatment at the beginning of the year.....	22
Admitted to out-patient clinic during the year.....	27
Former out-patients admitted during the year.....	9
Total out-patients treated during the year.....	58
Discharge from out-patient clinic during the year.....	32
Remaining under treatment June 30, 1918.....	26
Treatments (mess) furnished during the year.....	6,922

*Relative condition of patients at termination of treatment.*

	Hospital patients.	Out patients.
Improved.....	124	27
Not improved.....	17	5
Died.....	7	0
Total discharged.....	148	32

Among the 176 hospital patients treated during the year, 8 were insane; 2 of these recovered under treatment, 1 died, and 5 were discharged not improved.

*Laboratory studies.*—The work of the biochemical laboratory has consisted of the preparation of protein-free milk; of analyses of certain of the dietary ingredients of the Rankin farm diet; of feeding experiments with fowl, white rats, and rabbits; of investigations on the unsaturated and water-soluble fats of the Rankin farm diet; of the preparation of the antineuritic vitamine from yeast and to a limited degree from skim-milk powder; and of certain metabolic studies.

### POLIOMYELITIS.

#### ELKTON, VA.

At the request of State and local health officers, Asst. Surg. N. E. Wayson was detailed (bureau orders of July 31, 1917) to confer with such authorities and make a study of an outbreak of poliomyelitis in Elkton, Va., and vicinity. Advice was given as to the most practicable means of preventing the spread of the epidemic in Rockingham and Page Counties.

### RAT BITE FEVER.

#### INVESTIGATION OF CASE AT RICHMOND, VA.

Surg. G. W. McCoy was detailed to make an investigation of a case at Richmond, Va., suspected of being rat-bite fever. The investigation lasted from May 8 to May 16, 1918. It was found that the disease was undoubtedly rat-bite fever, which is fairly prevalent in Japan but rather rare in other parts of the world. A specimen of blood was secured from the patient for the inoculation of guinea pigs and mice.

### TRACHOMA.

#### TRACHOMA WORK IN APPALACHIAN MOUNTAINS.

*Report as to hospitals.*—At the close of the past fiscal year six trachoma hospitals were in operation. No additional hospitals were established during the year, but one has been moved and another closed pending the selection of a new location.

The Coeburn Trachoma Hospital, having accomplished the purpose for which it was commenced three years ago, was closed June 20, 1918. As soon as a satisfactory location is determined upon it will be reopened there.

The Trachoma Hospital at London, Ky., which was opened about three years ago, accomplished the purpose for which it was established and, in accordance with the policy of the service, has been moved to another location, Greenville, Ky., where trachoma is known to be unduly prevalent. About two and one-half years ago a survey was made and clinic held in the neighborhood of Greenville, Muhlenburg County, Ky., which is in the western part of the State. It was

shown at that time that there was sufficient trachoma to warrant establishing a hospital. The local community was very anxious for a hospital and furnished a 12-room building, rent free, for its use. The county voted \$600 in payment of the rent for the first year.

The other hospitals are located at Jackson and Pikeville, Ky.; Tazewell, Tenn.; and Welch, W. Va. All of these hospitals are in buildings which are furnished rent free by the local communities, the counties paying the rental. The only place where it has previously been necessary to pay part of the rental was Jackson, Ky. Recently, however, after the hospital had been located at Jackson for more than four years, the community showed their appreciation of the work which had been done by voluntarily assuming the whole of the rental.

The original idea of operating the hospitals for the cure of individual cases and for educational purposes has been adhered to during the past year. This work has now been in operation for the past five years, and during that time its results in both eradication and prevention are to be seen in a wide area and many States, as patients from practically all parts of the Union have been treated in these hospitals.

The total attendance at the six trachoma hospitals during the year was 13,954. The percentage of sequelæ was about in the same proportion as contained in previous reports. Sixteen hundred and thirty-seven were admitted and treated as hospital patients, and 1,281 operations performed. Of this number 381 were under general, and 900 under local anesthesia. Six hundred and ninety-nine cures were recorded, but, since the same difficulty in securing the exact number of cures has been experienced as in former years, it would be conservative to state that probably only about one-half of the cures have been seen and recorded as such. This is on account of the great difficulty experienced in seeing these cases once a cure is effected, as the patients live long distances from the hospitals. The total number of days' relief furnished was 20,697 and 28,175 rations were furnished at a total cost of \$10,632.23 for the six hospitals, making the average cost per ration 37 cents.

Some of these hospitals have now been in the same location for several years. This accounts for the smaller clinic than when first established. However, it is thought best to continue them for at least another year in the hope of getting the remainder of the trachoma cases. Another reason for the smaller clinic was the extreme weather experienced during the past winter. This rendered it impossible for patients to reach the hospitals for months at a time.

Further surveys for the purpose of locating trachoma hospitals in other States are contemplated as soon as it is possible to secure the additional assistance.

The following table reports the dispensary and hospital treatment given during the fiscal year:

*Dispensary and hospital treatment, operations, etc.*

Cases.	Jackson.	London <sup>1</sup>	Pikeville.	Welch.	Coeburn, <sup>2</sup>	Tazewell.	Total.
<b>DISPENSARY RELIEF.</b>							
Old cases, all causes.....	1,737	589	1,266	453	411	2,574	7,030
Old cases, trachoma.....	1,159	392	968	208	303	1,793	4,823
New cases, all causes.....	1,072	740	1,495	704	700	2,213	6,924
New cases, trachoma.....	217	147	340	89	112	434	1,329
Total attendance.....	2,809	1,329	2,761	1,157	1,111	4,787	13,954
Total number of treatments.....	3,108	1,399	3,152	1,164	1,111	4,956	14,890
Average daily attendance.....	7.7	3.7	7.6	3.2	3.0	13.1	6.4
Cases impaired vision from trachoma.....	136	86	267	63	46	208	806
Cases corneal opacity from trachoma.....	126	32	69	33	20	34	314
Cases blindness both eyes from trachoma.....	2	3	3	2	1	2	11
Cases blindness one eye from trachoma.....	2	11	17	4	11	1	35
Cases ulcer from trachoma.....	50	38	41	37	11	20	197
Cases pannus from trachoma.....	100	23	114	39	22	41	344
Cases entropion from trachoma.....	35	5	36	11	9	11	107
Cases trichiasis from trachoma.....	15	10	25	7	7	15	79
Cases photophobia from trachoma.....	143	86	127	57	33	155	601
Cases conjunctivitis.....	441	298	556	422	143	779	2,639
Cases glaucoma.....	3	-----	2	-----	2	-----	7
Cases trachoma cured.....	92	93	142	19	58	295	699
<b>HOSPITAL RELIEF.</b>							
Cases admitted during the year.....	230	170	436	147	162	433	1,578
Cases remaining from previous year.....	9	8	19	3	6	9	54
Cases discharged during the year.....	227	178	436	144	168	428	1,581
Cases remaining at close of year.....	12	-----	19	6	-----	14	51
Days relief furnished.....	3,279	2,376	6,725	2,102	1,134	5,081	20,697
<b>OPERATIONS.</b>							
Operations under general anesthesia.....	46	32	83	11	40	169	381
Operations under local anesthesia.....	127	85	223	82	78	305	900
Total number of operations.....	173	117	306	93	118	474	1,281

<sup>1</sup> London hospital discontinued June 1, 1918, transferred to Greenville.<sup>2</sup> Coeburn hospital discontinued July 1, 1918, pending relocation.

*Field clinics.*—The field clinics have been continued and 10 were held during the year. At these clinics 281 operations were performed, 264 under general and 17 under local anesthesia. About 115 physicians were present and were instructed in the diagnosis, prognosis and treatment of trachoma and its sequelæ. Ten thousand people were examined at the various clinics and 1,000 cases of trachoma found. If it is possible to obtain the services of sufficient nurses and doctors for the purpose of extending this work the clinics and hospitals will be extended into other States.

*District work.*—The district work at each of the hospitals has been conducted in much the same manner as in previous years. Three hundred and thirty-four talks were given to audiences estimated at about 2,000 people. Five hundred and twenty house-to-house visits were made, 283 schools visited, and a total of 24,000 children examined. Thirteen hundred and twenty-five cases of trachoma were found among these school children. Nine thousand four hundred and eighty-three pamphlets on trachoma were distributed.

*Cooperation with States and localities.*—Acknowledgment is made of the thorough cooperation of the State boards of health and the local health officers in the communities where this work has been carried on.

*Research laboratory.*—It has been determined to establish a research laboratory at Pikesville, Ky., for the purpose of searching for the cause of trachoma. The Pikeville Hospital will furnish a large clinic and plenty of material for this purpose. The laboratory apparatus is now being assembled, and an experienced man will be placed in charge. This laboratory will be established and in operation at a very early date.

#### RELATION OF TREATMENT OF TRACHOMA TO THE WAR.

Trachoma has had a very marked effect upon the drafting of soldiers for the National Army. A large number of men have been rejected on account of this disease in practically all parts of the country. On account of the splendid results obtained in the treatment of this disease by the service, recommendations have at all times been made that trachoma be not rejected, but these men be drafted and their cases cured before they be placed with the other men. A large number of men have been found suffering with trachoma at some of the cantonments, and were promptly discharged to their homes. Some of them considered trachoma as a means of gaining exemption from the Army when they did not desire to serve, and therefore refused to receive the proper treatment looking toward its cure.

Owing to the difficulty in diagnosing borderland cases of trachoma large numbers of men were rejected as being suspicious of this disease, when really it did not exist. In January of this year the Surgeon General of the Army detailed two eye specialists from his office to visit several of the trachoma hospitals for the purpose of observing the methods of treatment and the results. At the request of the Army Surgeon General a list of the instruments used and a detailed description of the surgical procedures and after treatments were furnished him. Following this the Army gave instructions to the draft boards to accept cases of trachoma when their vision was up to the requirements, and a trachoma camp was recommended where all of these men could be concentrated, cured of their disease, and then placed in the Army. It is not known what disposition has been made of this recommendation by the Surgeon General of the Army.

As many of the rejected trachomatous men as possible have been cured in the several trachoma hospitals. As a demonstration that this disease was curable, provided proper surgical measures were instituted, authority was granted to treat as many as 10 soldiers at one time suffering with trachoma from Camp Taylor in the Louisville Marine Hospital. The first of these soldiers were admitted on March 28, 1918. Twenty-three have been admitted for treatment since, and at the close of the fiscal year were all returned as cured with the exception of 7. It is expected that these will be discharged from the hospital as cured shortly. A number of school children in the extra-cantonment zone of Camp Taylor were found to have trachoma, and these cases were operated on and cured.



## SURVEY IN FLORIDA.

Requests for trachoma work have been received from numerous States in addition to those where the work is now being carried on, and these requests have been complied with as far as possible. By reason of the scarcity of nurses and doctors it has not been possible to extend the trachoma work as intended. In October last a survey was made through the northern, middle and southern sections of Florida, and clinics held at Jacksonville, Sanford, and Tampa. A three-day clinic was held at Sanford where the physicians had previously examined the schools of the neighboring counties for trachoma, and had selected about 500 persons for further examination. One hundred and twenty-seven of these were found to have trachoma. One of the large hotels at that place was utilized by the local community for a hospital and the 127 trachoma cases operated on by the service representative during three days. Many of the physicians of middle Florida were present and witnessed the work.

## CLINICS IN TEXAS.

Clinics were held in northern, middle, southern, and southwestern Texas. At the clinic held in middle Texas, 63 school children were operated on in one day under general anesthesia. This amount of work during one day was made possible only by the thorough cooperation of the local physicians who acted as anesthetists. Reports from these localities show that practically all of these cases were entirely cured within a very short time, and the children able to return to school. The fact that so many operations under general anesthesia were possible in one day shows how readily and rapidly the average case in a school child can be eradicated.

## TRACHOMA IN BIG HORN COUNTY, MONT.

At the request of the Montana State Health Board, Asst. Surg. A. J. Lanza inspected a school in Big Horn County, Mont., where cases of trachoma had been reported. All (57) of the children were examined, but no evidence of the disease was found. The fact that five half-breed children showed evidence of follicular conjunctivitis probably gave rise to the apprehension that there was an epidemic of trachoma in the school.

## TRACHOMA AMONG SCHOOL CHILDREN OF CAMDEN, ALA.

On request of the State health officer, an examination of the school children of Camden, Ala., was made by an officer of the service (October, 1917) to determine the prevalence of trachoma among them. A total of 205 children of an enrollment of 228 were inspected for this disease, namely, 115 boys and 90 girls. Of the boys, 8 were found to be suffering from conjunctivitis, 2 trachomatous and 6 follicular. None of the girls was suffering from trachoma. The origin of the disease in this community could not be determined.

## TUBERCULOSIS.

## VALLEY COUNTY, MONT.

In accordance with a request from the State Board of Health of Montana, Passed Asst. Surg. A. J. Lanza was detailed on October 14, 1917, to assist in a tuberculosis survey in Valley County, Mont., conducted by the State Association for the Study and Prevention of Tuberculosis.

This survey, the first of its kind in Montana, was very successful and aroused much interest. As a result, Valley County is constructing in Glasgow, a 15-bed sanitarium which will be the only county sanitarium in the State.

## TYPHOID FEVER.

## CHATTANOOGA, TENN.

In cooperation with State, county, and city health officials a study of sanitary conditions in the city of Chattanooga, Tenn., and vicinity, with special reference to the causation of typhoid fever, was made by Surg. L. L. Lumsden. The work was conducted in the first week of September, 1917, and included: (1) A review of the records of the city health department; (2) observation of public and private sources of water supply; (3) visits to dairies, ice-cream factories, etc.; (4) observations of the sewerage system and privies; (5) observation of methods of collection and disposal of garbage, stable manure, etc.; and (6) a detailed study of 42 of the 87 cases of typhoid fever occurring from July 15 and September 1. It was concluded that the vast majority of the cases were beyond reasonable doubt caused by infection distributed through ice cream, the principal ingredients of which were prepared and distributed from one of the dairy and ice-cream establishments in the city of Chattanooga. Recommendations were made to the authorities by Surg. Lumsden. The outbreak was particularly important in view of the proximity of Fort Oglethorpe to the city.

## GREENWOOD, MISS.

On request of the State and city health authorities, Surg. L. L. Lumsden was detailed to make an investigation of an outbreak of typhoid fever in Greenwood, Miss. The investigation lasted from November 8 to 10. It was found that 35 cases of the disease had occurred between August 1 and November 1, an excess of about 25 over the usual number for the period. The conclusion reached as a result of the investigation was that a small proportion of the cases may have been caused by infection conveyed by flies, fingers, water, and various foods other than milk, but that the preponderant factor in the spread of the infection was, beyond reasonable doubt, the milk supply distributed by a certain dairyman. At the end of the investigation definite recommendations were made to the city commissioners with a view to preventing a future outbreak of the disease.

## PARAGOULD, ARK.

A brief study of 60 cases of typhoid fever at Paragould, Ark., a city of 5,000 population, was made by Epidemiologist A. W. Freeman (now State health commissioner of Ohio) on August 30, 1918. The study was interrupted, so that no conclusions in regard to the cause of the epidemic could be reached.

## TYPHOID CONFERENCE IN JOPLIN, MO.

Surg. L. L. Lumsden conferred with State health commissioners of Oklahoma, Kansas, and Missouri in Joplin, Mo., December 21, 1918.

The subject of the conference was the organization of a health force to look after the sanitary conditions of counties in which extensive work in the mining and smelting of zinc is carried on. The health organization of this was found to be entirely inadequate.

It was decided that the State and county health officials should take steps necessary for the securing of an experienced service officer to serve in a supervisory capacity in the mining district.

## OCCUPATIONAL DISEASES AND INDUSTRIAL HYGIENE.

The past fiscal year has marked a rapid expansion of the investigations of occupational diseases and industrial hygiene, with a view to being of practical assistance in the efforts to keep production of war materials at the maximum. Headquarters have been maintained at Pittsburgh, Pa., where laboratory examinations necessary to the investigations have been made. For the first half of the fiscal year Surg. J. W. Schereschewsky was in general charge of the investigations; upon his detail as chief of the Division of Scientific Research, Passed Asst. Surg. A. J. Lanza was placed in general charge.

## SANITARY SURVEYS OF PLANTS MAKING WAR MATERIALS.

Sanitary surveys of plants making war materials in the Eastern States were commenced late in the fiscal year, the personnel of the division having been increased somewhat to permit these surveys to be thorough in nature. At the end of the investigation in each plant, a report is prepared containing specific recommendations for the improvement of sanitary conditions in the plant and a copy of it is sent to men in charge of the plant. In this way the information obtained during the survey is made immediately available and of use in the prosecution of the war. Copies of the reports are also furnished to the State authorities and to the Federal departments concerned.

These surveys were commenced in May, 1918, under the general direction of Passed Asst. Surg. A. J. Lanza.

The following industries are being investigated:

1. Shipbuilding industry.
2. Manufacture of airplanes, with special reference to precautions used in "doping" airplane wings.
3. Manufacture of military balloon fabrics.

4. Loading plants.
5. Chemical industry.
6. Portions of automobile industry doing war work.
7. Iron and steel industries, especially portions manufacturing ordnance, shells, and steel for shipbuilding.
8. Small arms industries.
9. Rubber industry.
10. Leather industry.
11. Electric storage battery industry.

#### SANITARY SURVEYS OF NAVY YARDS.

A sanitary survey of the eastern navy yards was made during the past fiscal year at the request of the United States Employees' Compensation Commission, with the concurrence of the Navy Department.

Passed Asst. Surg. Robert Olesen and Asst. Physicist Davis H. Tuck conducted these studies in the New York, Boston, Washington, Charleston, Portsmouth (N. H.), Philadelphia, and Portsmouth (Va.) Navy Yards and in the chemical works of the Naval Proving Ground at Indianhead, Md. The work was begun in December, 1917, and concluded in March, 1918.

Observations, conclusions, and recommendations were made relating to the following points:

1. Sanitary survey of navy yards, arsenals, and other industrial establishments under the supervision and control of the Navy Department, with special reference to the following points:

- (a) Hygienic construction.
- (b) Suitability from the standpoint of present use.
- (c) Illumination.
- (d) Ventilation.
- (e) Drinking water supply and facilities for distribution.
- (f) Wash rooms, change rooms, locker rooms, lunch rooms.
- (g) Disposal of excreta and wastes.

2. Health hazards: The study of working conditions involving exposure to:

- (a) Dust (organic; inorganic).
- (b) High temperatures and humidities.
- (c) Industrial poisons, including poisonous fumes and gases.
- (d) Undue physical strain.
- (e) Excessive vibration.
- (f) Excessive noise.
- (g) Excessively long hours of labor.

3. Measures in practice to diminish the effect of health hazards.

4. Facilities for medical and surgical care of workers.

- (a) First-aid facilities.
- (b) Dispensary facilities.
- (c) Amount of medical and surgical care given workers.
- (d) Study of records of morbidity and injuries.

5. Measures for the conservation of the health of workers.

- (a) Physical examinations and reexaminations.
- (b) Adaption of workers to work for which they are physically the best suited.
- (c) Education of workers in matters of personal hygiene.

... (d) Education of workers as to avoidance of occupational health hazards.

Complete reports with specific recommendations in the case of each survey were submitted to the Surgeon General of the Navy.

#### CONTROL OF MALARIA AT SHIPBUILDING PLANTS.

Supervision was assumed by the service over antimalaria and anti-mosquito work in the vicinity of shipbuilding plants at Wilmington, N. C. Special surveys of malarial conditions were made in the vicinity of shipyards at Beaumont, Austin, and Wichita Falls, Tex.

#### MEDICAL AND SURGICAL CARE OF INDUSTRIAL WORKERS.

One hundred and seventy industrial establishments, variously located in the Eastern and Middle Western States, were visited during the first six months of 1918 for the purpose of studying their medical and surgical facilities for the care of workers. This investigation was in charge of Consulting Hygienist C. D. Selby.

Among the different points which received consideration in this study may be mentioned: Relation of medical departments to industrial organizations; personnel of industrial medical departments; selection of industrial physicians; detached, part-time, or whole-time medical service; remuneration of industrial physicians; dispensary attendants; the special practitioners in industry; industrial dispensaries; activities of industrial medical departments; records and reports; cooperative medical service for small industrial establishments.

The investigation has a close bearing upon the conduct of the war, since any improvement in the medical and surgical care of industrial workers will assist in increasing the production of war materials. The results of the study have been prepared for publication. This bulletin will describe existing conditions relative to the organization, management, and operation of industrial medical departments, and will propose standards or ideals as suggested by analyses and observations based on this study.

#### CONFERENCES WITH MUNITION MANUFACTURERS.

The service has been represented on the subcommittee on sanitation, committee on welfare, advisory committee on labor, of the Council of National Defense by Asst. Surg. Gen. J. W. Schereschewsky. This committee prepared a series of precautions to be adopted for the protection of workers in the explosives and munitions industries. Before making recommendations as to the adoption of such regulations the committee called into conference the principal manufacturers in the country concerned in such industries to see if there were any objections from the practical standpoint to such recommendations. The regulations were published in the Public Health Reports for July 5, 1918 (Reprint No. 475).

#### VACCINATION AGAINST SMALLPOX AND TYPHOID FEVER.

In order to assist in preventing the spread of communicable diseases among war workers, the service sent to persons in charge of

establishments manufacturing war materials a circular urging them to require every person employed under them to be vaccinated against smallpox and inoculated against typhoid fever, as now done in the cases of the military forces.

The text of this circular follows:

TREASURY DEPARTMENT,  
OFFICE OF THE SECRETARY,  
Washington, June 4, 1918.

*To persons in charge of establishments manufacturing war materials:*

From the standpoint of health conservation and labor efficiency, it is imperative that such communicable diseases as smallpox and typhoid fever be prevented in all establishments manufacturing materials for the Federal Government. This is of special importance at the present time in view of the constant movement of labor from one locality to another, which facilitates so greatly the spread of disease.

The experience of every civilized country shows that complete protection is furnished against smallpox by vaccination, and temporary immunity against typhoid fever by inoculation with typhoid vaccine.

In order to prevent such diseases, upon the recommendation of the Surgeon General of the United States Public Health Service, persons in charge of plants engaged in the manufacture of war materials are urged to require every person employed under them to be vaccinated against smallpox and inoculated against typhoid fever, as now done in the case of our military forces.

The medical staff should be instructed to take the necessary steps for the enforcement of these measures. The need for them has already been demonstrated by the occurrence of isolated outbreaks of smallpox in establishments engaged in the production of war materials through imported labor. These outbreaks not only cause the quarantine of the personnel, but also interfere seriously with the production of materials necessary to the conduct of the war.

The Public Health Service is ready to cooperate in enforcing these measures, and any person calling at any of the service stations will, on request, be vaccinated against smallpox or typhoid fever free of cost.

J. H. MOYLE, *Acting Secretary.*

#### STUDIES OF SHOP LIGHTING CONDITIONS.

In coöperation with the Wisconsin industrial commissioner, studies of shop lighting conditions in the State of Wisconsin have been made by the service on a larger scale, the work being in immediate charge of Assistant Physicist D. H. Tuck. A special effort was made to conduct these studies in the work places of manufacturers having contracts for war supplies with the Federal Government. The studies have brought out the important part played by proper maintenance in having satisfactory illumination.

Circular letters were sent out to the manufacturers of the State, informing them that the studies would be made. As a result a large number of plants made requests for surveys which would indicate how their light conditions could be improved. In the case of a majority of plants where surveys were made and recommendations for improvements made, old equipment was remodeled and new equipment installed in order to procure better lighting conditions. A report of this work has been prepared.

When sanitary surveys of plants making war materials and of navy yards were undertaken, illumination studies were made one of the important features of the work. As in the case of the work in Wisconsin, recommendations for improving conditions were given to the operators of the plants.

Cooperative relations have been established with the United States Bureau of Standards.

During the year a paper on the "Lighting of industrial establishments," by Assistant Physicist Tuck, was published in the Public Health Reports and issued as Reprint No. 429. This paper dealt with the need for supervision of such lighting and suggested a system of maintenance rating for artificial light equipment.

#### VISUAL CONDITION OF WORKERS.

In connection with studies of vision, conducted as part of an illumination survey of Federal departments, a study of the incidence of color blindness among Federal employees was made by Surg. G. L. Collins. His report was published in the spring of 1918 as Public Health Bulletin No. 92.

#### INDUSTRIAL FATIGUE.

An investigation of industrial fatigue was undertaken in the summer of 1917 by the Public Health Service in cooperation with the divisional committee on industrial fatigue, Council of National Defense. The following members of the committee have been appointed by the service: Frederick S. Lee, as consulting physiologist; P. Sargant Florence, as supervising field investigator; Josephine Goldmark, as special expert; A. H. Ryan, as scientific assistant; Ernest G. Martin, as physiologist; and Ernest L. Scott, as physiological chemist. The service also maintained throughout the year a staff of from six to eight young men and women to collect and work over the data.

The field work began on July 17, 1917, and has continued uninterruptedly since that date. A considerable number of factories have been inspected, but the detailed investigation has been limited to two establishments which have offered exceptionally good opportunities for observation. About four months were devoted to a large factory employing about 39,000 hands and engaged in the manufacture of automobiles. The day's work was performed in three shifts of eight hours each. The rest of the time has been spent at a factory employing 12,000 to 13,000 hands, and engaged in the making of fuzes for explosive shell for war use, together with other metal manufacture. Here two shifts were employed—a day shift of 10 hours and a night shift of 12 hours and 20 minutes. One of the main objects in view has been the determination of the conditions under which the operatives, the human machines of the factory, can perform their work with the highest degree of efficiency. Every endeavor has been exerted to make the investigation exact, and the data secured have been statistical, taken in some cases from the existing records of the factories, but largely from quantitative measurements made by the field investigators. Subjects that have been considered include: Output, night work, effect of recess periods, accidents, and physiological tests for fatigue.

*Output.*—The hourly output of many individual operatives in many different operations has been measured and curves of daily output have been plotted. While these curves vary in detail for different types of operation, some of their common characteristics are for each working spell a rise, indicating a practice effect, followed by a fall, indicating in part at least fatigue; a greater height after than before the luncheon period, indicating a restoration of working power;

and a greater fall in the second than the first spell, indicating the cumulative fatigue of the whole working period. In muscular hand work there is little or no practice effect and the fall of working capacity is heavy and prolonged. In lathe work production tends to be remarkably stable throughout the day after a large practice rise. At the 8-hour factory output was maintained better than at the 10-hour plant, as is shown by the fact that with the former there was an hourly loss of only 3.5 per cent from the maximum hourly output, while with the 10-hour system the hourly loss was 5.3 per cent. At the 8-hour plant the average loss in output of the last hour of the working period was 15 per cent, while at the 10-hour plant the loss in comparable operations ran as high as 50 per cent. At the 8-hour plant the work of the shift began and ended almost on schedule, while at the 10-hour plant work often ceased 10 or 15 minutes before the closing hour of the shift. A striking example of inefficiency at the 10-hour plant was the prevalence in many departments of a voluntary limitation or "stereotyping" of the output. This was shown by a continuance of approximately the same amount of production day after day. That this was well below capacity was demonstrated by the ease with which the usual output was turned out in a much shorter time after the work had been stopped for a while, as by the breaking down of a machine.

*Night work.*—The night work, continuing during 12 hours and 20 minutes, in the fuze factory was characterized especially by a heavy loss in production during the final two hours, and an almost complete cessation in the last 40 minutes. There was a progressive slowing in the performance of the individual operations during the night, and during the final three hours many workmen slept.

*Effect of recess periods.*—In both factories under investigation the working spell had been unbroken by an established resting period. In each permission was obtained to introduce experimentally in certain departments such a period, consisting usually of a 10-minute recess in each of the two spells of the day shift. This resulted, in the 8-hour factory, usually in either no change or in a slight reduction in the total output. In the 10-hour plant, however, there was in the majority of cases an increase in the amount of work accomplished, an increase which augmented as the successive weeks went by and in some cases reached a maximum of 25 per cent or even more.

*Accidents.*—The investigation of the time at which accidents occur in the two factories reveals the usual rise and subsequent fall of the curve during the working spell. But accidents increase in number even while output is declining, the peak of the daily accident curve occurring about one hour later than the peak of the output curve. An important factor in the causation of accidents is, therefore, the cumulative fatigue of the spell. Another causative feature is the inexperience of the worker: when the number of accidents and the number of new employees in successive months are plotted the curves are strikingly parallel. The labor turnover is thus closely connected with the occurrence of accidents.

*Physiological tests for fatigue.*—The spring-balance test for determining the total strength of the human body, devised by Lovett and Martin, was introduced into industrial work, for the first time, in this investigation, and has been constantly and profitably em-



ployed. Three fields of industrial usefulness for it have been indicated; the physical classification of operatives, to aid in assigning them to suitable jobs; the determination of the physical condition of operatives in relation to their industrial efficiency; and the determination of fatigue. A few of the results that are already indicated are as follows: With men, but not so clearly with women workers, a standard strength has been found to exist for each job studied. Stronger workers tend to be more efficient industrially than weaker workers. The strength of all the workers in a given environment tends to fluctuate similarly from day to day, an indication that external factors act on all the workers alike. There is some indication that external temperatures of 85° F. or more reduce strength. Strong workers show less fatigue than weaker workers. Operatives in the 8-hour factory tend to show greater fatigue than those in the 10-hour plant, evidence, which was supported in other ways, that the former worked more nearly up to their physical capacity. Impairment of physical condition due to exhaustion may require a considerable time of rest for recovery. Days of fatigue or poor physical condition are likely to be followed by days of fatigue. There was found some evidence that night work, particularly when prolonged, tends to impair physique, but no impairment resulting from such work was found when the shift alternated to day work every two weeks. With men workers constant use of certain groups of muscles is accompanied by increase in strength of the musculature generally.

A vascular skin reaction test for fatigue, newly devised by Dr. A. H. Ryan, has been recently brought into the investigation and is yielding promising results. These are, however, not yet sufficiently complete to justify a specific report.

An experimental inquiry has been made into a possible chemical index for fatigue in the urine and the blood of industrial workers. It has been found that the average ratio of total sulphur excreted in the evening urine of workers, as compared with the morning urine, is 121.7, while with resting men the ratio is only 102.3, an indication that the disintegration of the sulphur-bearing moiety of the protein molecule is increased as the result of physical activity. With the inorganic sulphur excreted the respective ratios are 138.2 and 101.6, an indication that the released sulphur component of the protein molecule is oxidized in the molecular transformations accompanying work. These results have been confirmed by observations made upon runners in the severe exertion of a Marathon race. The total phenol of the urine shows no significant increase or decrease at the end of the day, a result that reveals no change in the detoxifying power of the organism. With the hydrogen ion content of the urine the ratio of evening to morning concentration in industrial workers is found to be 125.6 and in resting men only 80.3, a proof that physical work results in this significant physico-chemical change in metabolism. With six Marathon runners the ratio was 1,783, showing an enormous increase in H ions as the result of the excessive exertions. The general conclusion here indicated of the production of a state of acidosis in fatigue is substantiated by a series of experiments on animals which were fatigued by running in a wheel, after which their blood was examined. It was found that the hydrogen ion concen-

tration of the plasma was increased and its alkaline reserve decreased.

In the Public Health Reports for March 15, 1918, appears a paper by Scientific Assistant P. Sargant Florence on methods for field study of industrial fatigue (Reprint No. 458).

#### HEALTH HAZARDS OF CHEMICAL INDUSTRY AND HEALTH OF CHEMICAL WORKERS.

Studies of the health hazards in a large chemical company, commenced in 1916 on request of the company, were concluded in July, 1917. In addition to sanitary surveys in the factories, the physical condition of chemical workers was studied by means of careful physical examination, special attention being paid to the effects upon health of work in the manufacture of nitro and amido derivatives of benzol. During the course of the study it was practicable to make important recommendations to the superintendents of the various plants to enable them to improve the conditions surrounding the workers.

These studies were carried out by Asst. Surg. Gen. J. W. Scherschewsky, then in charge of the investigations of occupational diseases and industrial hygiene. Passed Asst. Surg. Robert Olesen, Scientific Asst. Allen R. Howard, and Scientific Asst. Harmon West.

In compliance with a request from the State board of health and the State Labor Department of Michigan, Surg. A. J. Lanza was detailed in March, 1918, to investigate conditions in the plant of the Lansing Chemical Co., which is manufacturing picric acid under contract with the Government.

#### HEALTH HAZARDS IN CONNECTION WITH MANUFACTURE AND DISTRIBUTION OF ILLUMINATING GAS.

At the request of the Federal Bureau of Standards a study of the health hazards connected with the distribution and manufacture of gas was made, so that the necessary recommendations for the protection of workers might be incorporated in a national gas safety code which was being prepared by the Bureau of Standards. This work was brought to a completion in July, 1917.

#### HEALTH HAZARDS OF THE TEXTILE INDUSTRY.

During the first part of the past fiscal year, studies of the conditions surrounding the textile industry, commenced on request of the State Department of Labor and Industry of Pennsylvania, were continued until sufficient data had been obtained for the preparation of a code for the regulation of the industry in Pennsylvania from the safety and health standpoints. The field work was in charge of Surg. F. C. Smith, assisted by Scientific Assts. William P. Bramlett and Lloyd W. Johnson. It was found that on the whole the processes studied presented but few hazards to the health, although numerous defects in regard to ordinary factory sanitation were found.

#### MITIGATION OF HEAT HAZARD IN INDUSTRIES.

A paper on the mitigation of the heat hazard in industries, by Passed Asst. Surg. J. A. Watkins, was published in the Public

Health Reports on December 14, 1917, and issued as Reprint No. 441. This paper was based upon investigations previously made by the service.

#### TRINITROTOLUOL POISONING.

At the Hygienic Laboratory systematic studies were commenced in regard to the methods of absorption, detection, and prevention of trinitrotoluol poisoning. These investigations are expected to be of great assistance in providing sanitary requirements which will minimize the danger from trinitrotoluol, an explosive in general use by munition plants.

Trinitrotoluol is a high explosive derived by the nitration of toluol. It is used principally as a charge in high-explosive shells. Its manufacture is surrounded with considerable risk of poisoning, which may readily be fatal unless proper sanitary precautions are taken. The chief danger is chronic poisoning, as trinitrotoluol attacks the blood cells and may also attack the liver cells. The chief avenues for absorption are through the skin and through the lungs when inhaled as fumes. Owing to its slow solubility, it is not nearly so poisonous when swallowed.

In August, 1917, a survey was made of a large trinitrotoluol manufacturing concern at Barksdale, Wis.

Up to the end of the fiscal year the work which the Division of Pharmacology has undertaken in regard to this matter has been confined to the study of the action of trinitrotoluol on experimental animals for the purpose of (1) obtaining a clear understanding of this intoxication; (2) discovering diagnostic means applicable to the human for the early recognition of poisoning; and (3) studying the influence of diet and alcohol on the susceptibility to trinitrotoluol poisoning. Many observations which promise to be of practical value have been made.

The Division of Chemistry has in hand the investigation of (1) analytical procedure for the detection of trinitrotoluol in the atmosphere and in animal tissues and excretions; (2) the chemistry of trinitrotoluol, its manufacture and impurities; and (3) the vapor pressure and volatility of trinitrotoluol as influenced by temperature and humidity.

Field studies of the hazards connected with the use of trinitrotoluol have been made in plants manufacturing the substance and in those loading it into shells.

#### SANITATION AND MEDICAL RELIEF AT GOVERNMENT EXPLOSIVES PLANT.

Upon request of the Secretary of War the Public Health Service undertook the sanitation and the medical and surgical relief at the United States Explosives Plant C. Nitro, W. Va., during the period of construction. This duty was assumed February 17, 1918. At the time of the assumption of these duties there was practically no construction completed on the site of the proposed plant.

A personnel of about 500 were employed in this work, including laborers, artisans, laymen in numerous capacities, 20 medical officers, and 30 nurses. The medical officers were acting assistant surgeons of the United States Public Health Service, with the exception of Past Asst. Surg. J. A. Watkins, who had been placed in charge.

Nurses were furnished by the Bureau of Nursing Service, American Red Cross.

*Examination of applicants for employment.*—A suitable building was erected and properly fitted out, both in supplies, equipment, and personnel, for the purpose of examining physically applicants for employment. In this way it was possible to prevent the introduction of communicable or infectious diseases, including venereal diseases. It was also possible to determine various physical defects or diseased conditions in men which were amenable under prompt and proper treatment.

Practically no rejections were made of any men because of physical disability. All capable of performing work at all were, through the physical examination, put at some occupation at which they were able to earn a livelihood in a manner not detrimental to their physical condition.

To date, 45,858 applicants for employment have been examined. Of this number approximately 0.008 per cent have been permanently rejected. Some of these rejections would not have necessarily been made in an established industrial institution, but were of necessity made in the type of work being carried on at Nitro.

It is of interest to note that the physical condition of the men, on the whole, was poor, and that of the number enrolled, approximately 0.11 per cent were enrolled with marked physical disabilities noted, such as loss of members, loss of sight, hearing, etc.

The temporary rejections for the fiscal period number 867, or approximately 0.018 per cent. These, relatively speaking, were all venereal cases, which were referred immediately to the proper department, where they were subjected to treatment, rendered noninfectious and immediately placed at work. Unless they deserted, they were eventually cured by continued treatment. In this way the labor supply was conserved, the men were not refused the right to earn a livelihood because of their unfortunate infection, and in addition, they were not thrown into society in an infectious condition.

*Delousing.*—While stripped for the physical examination at the employment office, the clothing of the applicants was searched for pediculosis. In addition, the bed clothing in the barracks was daily examined for cleanliness and infestation. In this manner 1,690 men infected with pediculosis were discovered.

In view of the increasing importance being placed upon the louse as a transmitter of disease, immediate steps were taken in each instance to delouse these men. For this purpose a set of three buildings were constructed: A temporary detention barracks; a delousing house; and a cyanide fumigation house.

The men discovered to be infested were temporarily placed in the detention barracks. They were then sent through the delousing house, where they were subjected to a cleansing bath, medical inspection and treatment. In the meantime their clothing was run through the sterilizer. Their bed clothing was placed in the small air-tight building and subjected to cyanide fumigation.

It is of interest to note, however, that in spite of most rigid inspection and treatment, cases of pediculosis constantly escaped notice, to be discovered at a later date.

*Venereal control.*—The matter of venereal control is mentioned in connection with the discussion of examination of applicants for employment.

A separate building in the general hospital unit was set aside for these cases, and a separate complete organization assigned to this work.

Very satisfactory progress was made in the matter of the curing of the venereal infected. The most recent methods were employed with good results. A number of unappreciative men deserted the hospital before a cure was effected.

*Public health education.*—The opportunity to extend knowledge of the cause, proper treatment of and prevention of disease, the maintenance of health, bodily and mental hygiene, was taken advantage of, and consisted in the distribution of such information among the employees, in the form of popular-worded leaflets, bulletins, barrack talks, Young Men's Christian Association talks, lantern slides, etc. Particular emphasis was placed upon the subject of venereal diseases and the value of prophylactic inoculation and vaccination.

*Prophylactic measures.*—At the time of enrollment, the men were vaccinated against smallpox and they were also encouraged to receive the typhoid inoculation. By means of the public health propaganda later carried on it has been possible to spread the knowledge of the value of these measures among those employed at this plant, with the result that 73,162 persons have received prophylactic typhoid inoculations. Owing to changes in personnel, it has not been possible to complete the course of treatment in many of these cases, though by far the great majority of those who remained on the plant have completed this treatment.

*First aid instruction.*—First aid instruction has been attempted in the case of police officers and those employed in the plant in the more important working positions, with the view to the prompt rendering of the correct attention to those seriously injured in the performance of their duties.

*Hygiene of housing.*—The employees of the plant during the period of construction were being housed in buildings similar in most respects to the barrack buildings as constructed for the use of the Army during the period of mobilization. With a view to the acquisition and maintenance of the proper hygienic conditions, a separate division was made of this subject and the proper and adequate personnel assigned to this duty, which consisted of the attention to such subjects as ventilation, illumination, the maintenance of proper temperature, washing, toilet facilities, baths, adequate and clean bed clothing, extermination of vermin, etc. In addition, an inspection was made from time to time with the view to determining at the earliest possible moment the presence of communicable diseases. Upon the discovery of such cases, isolation for the protection of the remainder of the force was carried out.

*Public health activities.*—Various employees, executive and others, are housed in bungalows in Nitro City, as distinct from the plant proper. The number thus assigned was relatively small, about 1,500. There was formed, however, a miniature health organization, modeled much after the organization of our larger cities, and carrying on the same duties.

As a result of the activities of the housing and public health divisions, it is possible to report that though at least one, generally two or more, cases of the more common infectious or communicable diseases were imported, no secondary case has occurred at Nitro.

*Sanitation.*—The matter of sanitation on a construction undertaking of this magnitude involved much labor and time. This was especially brought about by reason of the extensive area to be covered; the lack of availability of proper sewage and water distribution systems; opportunity for mosquito and fly propagation; and the immense amount of waste refuse, *débris*, etc., in connection with the arrival and erection of the enormous amount of material, equipment, and supplies, and the rapid construction of buildings. In addition it was necessary to employ in this work several thousand horses and mules, which were stabled at the most convenient point from the construction viewpoint, rather than from the viewpoint of the sanitary department.

To date there have been 1,055 latrines constructed. A total of 13,109 forty-gallon cans of garbage have been disposed of, while 14,085 wagonloads of refuse of various sorts have been incinerated.

A total of 11,970 tons of manure has been safely disposed of.

*Food inspection.*—The inspection and regulation of the quality and cleanliness of the food being served to the men on this plant has received special attention. Toward this end a special division has been created.

Foodstuffs are inspected and made subject to sanitary regulation from their source until the time of consumption on this plant. This regulation includes the control of the proper conditions under which it is produced, shipped, received, stored, handled, prepared, and served.

The value of such regulation from a health standpoint is evidenced by the fact that of the 1,673,123 meals served to date on this plant there has not yet come to the attention of this department, i. e., applied for medical relief, a single case of food poisoning.

*Medical and surgical relief.*—In rendering medical and surgical relief to employees of this plant there are being constructed four six-bed emergency dressing stations about the plant, one out-patient dispensary in the bungalow section, a 40-bed emergency hospital, and a 325-bed general hospital.

In addition to the relief of those acutely ill or injured, relief is afforded to those afflicted with disabilities of greater duration, and constructive and repair work, such as eye, nose, and throat afflictions, dentistry, etc., is to be carried out.

*Admissions.*—To date 478 people have been admitted to the hospital for medical or surgical relief.

*Safety first.*—The safety-first work is under the direction of Mr. C. B. Hayward, who is acting representative of the United States Employees' Compensation Commission. This department is established in the medical division, and the proper cooperation and co-ordination of efforts exist.

*Conservation.*—With a view to conservation, even under the conditions of rapid construction and extreme pressure of business, endeavor is being made to turn over all garbage to hog raisers, manure to farmers, and an 8-acre garden has been established in connection with the operation of the general hospital.

*Industrial hygiene.*—The matter of industrial hygiene is being given attention with a view to the acquisition and maintenance of such hygienic working conditions as will assist in the maintenance of the health and efficiency of the working force.

## SUPERVISION OF SANITARY CONDITIONS IN NASHVILLE, TENN.

At the request of the State Board of Health of Tennessee, supervision was assumed of sanitary conditions in the vicinity of the Government plant near Nashville, Tenn., following a survey to determine sanitary conditions affecting war industries in Tennessee.

## MINE SANITATION.

Investigations of the occupational diseases of the mining industry and of mine sanitation, conducted in cooperation with the United States Bureau of Mines, were continued during the last fiscal year.

*Butte (Mont.) district.*—Studies in this district were started in June, 1916, and have been carried on, more or less continuously, until the spring of 1918. During this period four mines were examined in detail, the investigators going into every working place in the mine from the surface to the lowest level, including drifts, crosscuts, stopes, and raises. In addition to detailed examination of four mines, at least 20 other mines were entered and conditions examined somewhat less thoroughly. The work was done by Past Asst. Surg. A. J. Lanza, of the service, and D. Harrington, of the Bureau of Mines.

*Miners' consumption.*—The principal occupational hazard noted in these mines, as during a previous study in the Joplin (Mo.) district, is miners' consumption. This disease is mechanically produced, is neither contagious nor infectious, develops slowly, and by the production of scar tissue in the lungs gradually impairs their function. Miners' consumption may in itself produce disability and death. As a matter of fact, this disease so predisposes the victim to various infections of the lungs and bronchial passages that few escape infection.

*Bureau of Mines rescue cars.*—As a result of the extended investigations in the Joplin and Butte districts, the service has been able to set forth the causes, the nature, and the prevention of miners' consumption. It was therefore concluded that future studies should be confined to establishing the presence of the disease in any particular territory. For this purpose, the bureau has continued cooperative arrangements with the Bureau of Mines and Past Asst. Surg. H. M. Thometz and Asst. Surgs. R. C. Williams, R. R. Sayers, and J. F. Worley have been kept on the Bureau of Mines rescue cars for the purpose of making surveys to determine the prevalence of miners' consumption and to assist in the other work of the cars. The following items are considered as coming within the scope of duty of the service officers on the cars:

1. Rendering first aid in case of accidents.
2. Making investigations, in so far as practicable, at all places visited, and recording the data, to be coordinated with like records from other cars for publication. Sanitary conditions of mines and mining camps are studied and physical examinations made of miners.
3. Giving first-aid instructions to the personnel of the Bureau of Mines and to miners when so requested by the engineer in charge of the car.
4. Advising with the Bureau of Mines' personnel on technical subjects.

- ## HEALTH INSURANCE.

In order to promote uniformity in the keeping of these records by the several benefit associations and establishments, a standard card has been prepared and will be furnished to the concern which will be willing to make regular reports to the United States Public Health Association. This card was prepared by a committee of the American Public Health Association, on which were representative statisticians, officers of large industrial establishments, and the Public Health Service. The card should be at least 4 by 6 inches and contain the information and instructions according to the following form:

[On reverse of record card.]

*Date employment ended.*—Give date of termination of service if employee resigned or was discharged, or of death if employee died.



*Occupation.*—Occupation should be stated definitely to indicate the particular kind of work done in the department—for example, sand blaster of metal parts, japanner, oven tender, mixer, wringer, dipper. Do not use such indefinite terms as laborer, machinist, foreman, operator. If employee is exposed to poisons, deleterious dust, heat, fumes, or humidity, please specify.

*Dates of absence.*—The date of beginning of absence is the date on which the employee quit work, irrespective of the hour. The date absence ended is the date prior to the one on which employee returned to work, irrespective of the hour.

*Total days lost.*—This is the period between the date of the beginning and the date of the close of the absence, including Sundays and holidays.

*Sickness or nonindustrial injury.*—Record the disease or condition causing disability as given by the attending physician. Where there is no physician, give the diagnosis as described by the employee. State disease or condition in the most definite terms. For example, do not use such terms as "colds," "cough," "disability," "weakness," "fever." Injuries should be recorded only if nonindustrial in character—that is, if they happened outside of working hours while employee was not at work. Occupational disease should be recorded.

*By whom diagnosed.*—Record whether by physician, nurse, or patient.

*Condition on close of case.*—State whether "Recovered," "Improved," "Unimproved," or "Died."

*Remarks.*—Give any additional information pertinent to the case.

In addition to the record of sickness a record of personnel is essential to the study of industrial morbidity. It will therefore be necessary to keep the personnel record on this card whether the employee is sick or not. Such a uniform record will enable the Public Health Service to collect, analyze, and publish these reports in a series of statistical tables according to age, sex, occupation, and the like. Such tables should be of value in the study of the hazards of occupations.

#### EFFECT ON HEALTH OF PNEUMATIC STONECUTTING TOOLS.

On request of the Bedford (Ind.) Stone Club Auxiliary, an investigation was made of the effects upon health of the use of pneumatic stonecutting tools in the stone quarries of the Bedford district. Passed Asst. Surg. J. P. Leake and Prof. David L. Edsall, consultant in industrial hygiene, were detailed to make the investigation.

It was found that there existed in the hands of stonecutters who used pneumatic hammers a hypertonicity of the blood vessels which shows itself as an exaggerated reaction to low temperatures. This was not found to be serious as to life or function, but was uncomfortable at times. Suggestions were made for changes which would eliminate the trouble without making it necessary to get rid of the pneumatic hammers.

Reports of the investigation were published in the Public Health Reports for March 22, 1918.

#### DISINFECTING OF GARMENTS.

On request of the Quartermaster General's Office of the Army, the service detailed Passed Asst. Surg. H. E. Hasseltine to make tests of the Barbe method of cleansing and sterilizing garments at the plant of Bornot Bros. Co., Philadelphia.

## PUBLIC HEALTH ORGANIZATION AND ADMINISTRATION.

## STUDY OF COUNTY HEALTH ORGANIZATION.

For the purpose of working out principles of public health organization and administration which are feasible of adoption in county or municipal public health work, Asst. Surg. K. E. Miller continued the study of county health work in Edgecombe County, N. C., serving in the capacity of acting health officer.

The general scope of the work included quarantine, child welfare, supervision of midwives, hygiene and sanitation, school inspection, vaccination and educational work in the county.

The most important undertaking for the coming year is the installation of a municipal pasteurization and distributing plant for milk in the town of Tarboro, the county seat.

## COOPERATION WITH INDIAN SERVICE.

As in the past, examinations of specimens to aid in the diagnosis of communicable disease have been made at the service laboratories for physicians of the Indian Service. The work includes ordinary examinations and tests of a bacteriological nature.

Antityphoid vaccine is furnished through the Hygienic Laboratory to the Office of Indian Affairs on request.

## COOPERATION WITH HAWAIIAN AUTHORITIES.

In cooperation with the Quarantine Service and with the local health authorities, the following work was performed: Wassermann's test, 155; Widal's test, 282; 57 specimens of fleas examined for the presence of *B. typhosus*, 10 specimens of water were examined bacteriologically as well as 44 miscellaneous specimens.

During the past year, 139 cases of leprosy have been under treatment; 87 cases were transferred to Molokai, 9 cases were paroled, 6 cases died and 2 cases transferred, leaving 35 cases under treatment at the end of the fiscal year.

## COOPERATION WITH PORTO RICAN AUTHORITIES

At the request of the Governor of Porto Rico, Past Asst. Surg. Liston Paine was detailed for duty with the Institute of Tropical Medicine and Hygiene of Porto Rico. This detail was in addition to his duty as chief quarantine officer for Porto Rico.

The institute is an organization of the Government of Porto Rico for the study of diseases peculiar to that country and climate, and is composed of physicians with special experience in such lines.

Dr. Paine was engaged in work on sprue, and intestinal diseases peculiar to the Tropics; his work included a study of the vaccine given patients suffering from sprue; an effort was made to determine just which diet was the best for these patients; and the reaction of the intestinal tract was studied, to learn the effect of acid and alkaline media on the growth of the *monila psilosis*, his belief being that the normal alkaline reaction of the intestine must be changed to a highly acid one to favor the growth of the causative factor of sprue.

Dr. Paine also collected data in regard to filariasis, hoping to show some relation of humidity, temperature, and barometric pressure to the prevalence of the above infection.

His other studies included also malaria, uncinariasis and skin diseases.

A zoological study of the native tick was begun, to determine its relationship to the *Dermacentor andersoni*—the host of the organism which causes Rocky Mountain spotted fever; these studies were not finished, due to Dr. Paine's transfer to the Virgin Islands.

#### COOPERATION WITH STATE BOARD OF HEALTH OF ALABAMA.

On request of the State health officer, Asst. Surg. G. C. Lake was detailed on August 30, 1917, to assist the State board of health in the conduct of the laboratory at Montgomery. The need for an officer from the service was that the laboratory had been crippled temporarily through the resignation of its director and, soon after, of the man placed in temporary charge. In addition to assisting in the routine of the laboratory, Dr. Lake carefully studied the methods, executive and otherwise, in force at the laboratory and made recommendations for securing a more efficient service.

#### SCHOOL AND MENTAL HYGIENE.

Field investigations of school and mental hygiene in charge of Surg. T. Clark, have been of limited extent during the past fiscal year, owing to demands occasioned by war-time conditions on the personnel and budget of the service. These have caused the assignment of officers formerly engaged in this work to duties more directly related to the conduct of the war. The necessity of continuing studies of this character, however, especially such as are designed to bring about a more widely distributed health supervision of school children is appreciated. The potential loss of life in the belligerent countries of Europe, estimated at 7,000 each day the war continues through loss of births occasioned by the war, emphasizes the possibility of a like decline in the birth rate in this country and the necessity of the exercise of measures for conserving the lives of the children who may be born and of those who are now living.

Although the field activities of the service in school and mental hygiene have been limited, officers of the service have been supplied on requisition in numerous instances to serve in an advisory capacity. Moreover, compilation and correlation of data collected in the course of investigations during the previous year are rapidly nearing completion. It is confidently predicted that, as a result of this work, much valuable and interesting information will become available generally.

#### MENTAL STATUS OF THE BOYS OF THE NATIONAL JUNIOR REPUBLIC.

On the request of the superintendent additional mental examinations were made (July, 1917) by an officer of the service of the boys admitted to the National Junior Republic, Annapolis Junction, Md. Including 19 boys examined at this time, a total of 119 new admissions to this institution have been examined since May, 1914,

of which number 53 per cent were mentally normal. Of the boys with abnormal mentality, 10 per cent were feeble-minded, 6 per cent were of a psychopathic makeup or personality, 3 per cent exhibited a perversion of sexual instinct in the form of homosexuality, 23.6 per cent were mentally retarded, and in 4 per cent the diagnosis was reserved.

The children of this institution are recruited from homes where they are unmanageable, from immoral surroundings, by various benevolent leagues and other charitable organizations, and through commitment by juvenile courts. The cooperative plan of correction practiced at this institution may serve well in the case of normal boys, but does not take into account or make provision for boys of certain personality that renders them unable to cope with relatively complex environments without individual supervision. The value of studies of this character as a guide to admission to this estimable institution is obvious.

#### HEALTH SUPERVISION OF SCHOOL CHILDREN IN EXTRA MILITARY ZONES FOR THE CONTROL OF COMMUNICABLE DISEASES.

Service officers were detailed from time to time during the year to study sanitary conditions in the schools in the civil districts adjacent to and immediately surrounding a number of Army camps and naval bases and to advise with local authorities in regard to the inauguration of a system of health supervision of school children as a part of the general plan of sanitary supervision of these areas. These officers visited 10 States for this purpose, and in 9 other States the work was inaugurated by officers in charge of the sanitation of extra cantonment zones. Incidental to the primary object of this supervision, the control of communicable diseases, 66,142 children were examined for physical defects, of which number 46,798, or 70 per cent, were found suffering from more or less serious physical impairment. Corrections were reported in the case of 2,152 children, or 4 per cent of those reported as physically defective. Detailed reports will be found for each zone under the heading "Sanitation of extra cantonment zones," pages 103-160.

#### MENTAL AND PHYSICAL STATUS OF CHILDREN IN PELLAGROUS COMMUNITIES.

Physical and mental examinations of children in connection with pellegra studies in certain cotton mill villages of Spartansburg County, S. C., inaugurated near the close of the last fiscal year, were continued to a limited extent during the past fiscal year, but because of the war were finally terminated sooner than otherwise would have been the case. The data collected in the course of these investigations are now being compiled. It is hoped that these studies, limited though they were, will give a better insight into problems relating to the nutrition of school children.

#### RURAL SANITATION.

##### NATURE OF WORK.

New work undertaken to improve rural sanitary conditions has been confined to extra cantonment areas. It was, of course, necessary

to complete certain pieces of work which had been begun before the outbreak of war. On account of the modifications in the character of the work and the state of unrest generally, the studies and demonstrations have been less systematic than would otherwise have been the case.

In planning studies and demonstrations, three methods have been tentatively adopted: (1) Intensive study of an entire county; (2) intensive studies of strings of towns along railway lines; (3) maintenance of a county health officer in a county. Examples of these three methods are: (1) Okmulgee County, Okla.; Mason County, Ky.; and Hill County, Tex. (2) Studies of towns along the Union Pacific Railroad and other towns in Wyoming. (3) Assignment of a service officer as health officer in Edgecombe County, N. C.

Until the present year, the intensive studies in a county consisted of the securing of numerous data regarding the sanitation of individual premises, and incidental education in an effort to encourage improved sanitation and the employment of full-time health officers.

Under a special appropriations from Congress demonstrations in rural sanitation have been conducted upon a cooperative arrangement, the State or local authorities paying one-half of the expense of the demonstration. Under this provision it has been possible to conduct the demonstration part of the work on an intensive and a lasting scale. Outside of the work in Mason County, Ky., however, these demonstrations have necessarily been limited thus far to the extra cantonment areas. In a large number of these areas the service supervised the installation of sanitary privies, especially of the double compartmented concrete vault type. In view of the danger of the transmission of disease from the extra cantonment zones to the soldiers, this work has not only a demonstration value, but an immediately practical aspect. Many of the zones have been so successfully sanitized that not a single sanitary privy remains within their borders. What that means as a measure in the prevention of communicable disease and as a demonstration on a practical scale to nearby districts may readily be imagined.

#### THE PROBLEM.

The problem of rural sanitation has been recognized by sanitarians as one of the most difficult and important of those which they must face. It is difficult because of its diffuseness. In the well-ordered city, such important matters as water supply and disposal of sewage and other waste matter are dealt with in mass, under the direction of the municipal authorities, and the individual citizen has to concern himself with them but little. For the average rural district to obtain a water supply, on the contrary, a spring must be found, a well dug, or a cistern constructed for each home. The protection of the water supply against contamination depends upon the common sense, knowledge, and efforts of the many different householders. Similarly the methods of disposal of human excreta and of other refuse at a country home depend upon the knowledge of the subject and the sense of cleanliness exercised by the household. The farmer must be to a large extent his own health officer, his own sanitary engineer, and the operator of his own refuse-disposal sys-

tem. The improvement of rural sanitation, therefore, depends upon the education of each householder—a slow process.

The need of advancement of rural sanitation is all too obvious even from casual observation. In the cruder matters of sanitation, such as the cleanly disposal of human excreta, the safeguarding of water supplies against contamination with filth, and the protection of foods from invasion by flies, most of our country homes are lacking. Statistics show that much better progress in the prevention of diseases is being made in cities than in rural districts. Typhoid fever, which in many sections of the country is more prevalent in the rural districts than in the cities, is a disease spread almost entirely through insanitary conditions.

#### RURAL SANITATION WORK PRIOR TO 1917.

It is because of these facts that the service has carried on extensive studies of sanitary conditions with a view to educating the people to a point where they will improve them. As a result of studies conducted in 1914, 1915, and 1916 a bulletin on rural sanitation has been prepared and is now in course of publication. This bulletin reviews present conditions and the importance of improving them and gives a detailed report for each county in which work in rural sanitation was carried out during these years. These counties are Berkeley, W. Va.; Lawrence, Ind.; Union, Miss.; Dorchester, Md.; Anne Arundel, Md.; Wilson, Kans.; Orange, N. C.; Walker, Ala.; Dallas, Iowa; Greenville, S. C.; Floyd, Ga.; Tuscaloosa, Ala.; Obion, Tenn.; Clay, Mo.; and Cumberland, Ill.

#### SURVEYS OF COUNTIES IN 1917.

In 1917 complete surveys were made of Hill County, Tex.; Okmulgee County, Okla.; and Mason County, Ky. That of Hill County was generally similar in nature to those made in previous years. It was commenced on December 3, 1917, and concluded on August 21, 1917. During the survey 10,441 homes were inspected, 1,710 homes were revisited, 127 churches, 123 schools, and 502 stores were surveyed, and 112 lectures were given. Marked progress in sanitary conditions followed the survey.

The survey of Okmulgee County, Okla., was similar in character to that of Hill County. A total of 8,212 homes were inspected, 1,885 reinspected, 14 railroad stations, 50 schools, 20 churches, 55 stores, 14 post offices inspected, and 95 public lectures given. The service supervised the installation of sanitary privies in the 1-mile zone adjacent to the city limits of Okmulgee. Much time was spent by the service officer in charge of the work in furthering bond issues for water and sewerage systems in Okmulgee and Henryetta and in trying to establish an adequate county health organization.

In Mason County, Ky., demonstrations in rural sanitation were conducted, \$6,600 having been appropriated by the State and local authorities for the purpose. An equal amount was appropriated from Federal funds. The survey was significant, therefore, in that it was brought about by an affiliation of county, State, and United States Government funds for the one purpose of conserving the health and saving the lives of Mason County's citizens. The survey

of this county was begun on May 24, 1917, and ended September 7, 1917. In all 2,200 homes were surveyed in the rural districts and 1,640 in incorporated towns. The type of privy recommended for the rural homes in this county was generally the "Kentucky sanitary privy,"<sup>1</sup> the operation of which depends upon the action of the nitrifying bacteria in stable manure (added to the excreta) in breaking up and changing human excreta from a dangerous element to a potentially less dangerous, colorless liquid, and a solid material known as sludge. At the time of the house-to-house canvass, the visiting officers explained to the heads of the households that if they desired privies of this kind on their premises, the survey force would send laborers to their homes to do the construction work, provided the heads of households furnished the necessary material incident to such construction. Contracts were signed by the householders. During the summer and fall of 1917, 300 high-grade privies of the kind mentioned were installed under this cooperative plan in Mason County.

#### DEMONSTRATION WORK IN EXTRA-CANTONMENT ZONES.

In the extracantonment areas the plan of work is similar to that in Mason County. Reports of the work will be found under the heading "Sanitation of extra-cantonment zones" for each zone in which demonstrations in rural sanitation were made. (See pp. 103-160.)

#### SURVEYS OF WYOMING TOWNS.

Asst. Surg. R. E. Wynne, assisted by a sanitary engineer of the Public Health Service, has made a sanitary survey of a group of rural towns in Wyoming. Their work has been along the same general lines as those followed in the surveys of whole counties, but has been confined to towns and villages, principally along railroads. Country homes in the vicinities of the towns were surveyed in sufficient number only to obtain an indication of the sanitary needs of the country neighborhoods. This plan of work appears particularly suited to sections of the country in which most of the population is in towns and in which the strictly rural districts are very sparsely settled. The purpose of the plan of work started in Wyoming was to determine the degree of advancement in sanitation and in health protection which can be accomplished in counties by work confined largely to the towns and villages as compared with that which can be accomplished by work, relatively much more expensive, which is extended to all homes in counties.

#### EXPERIMENT IN EDGECOMBE COUNTY, N. C.

In Edgecombe County an officer of the Public Health Service is making a practical study of county health work. He is serving as whole-time county health officer, all expenses except his salary being borne by the county. The purpose of the experiment is to ascertain what can reasonably be expected in the way of sanitary advancement in a county from the whole-time services of one man with reasonably adequate qualifications for county health work. A report of the ex-

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<sup>1</sup>A modification of the L. R. S. privy, mentioned in previous reports.

periment will be found under the heading "Public-health organization and administration," page 48.

#### SEWAGE-DISPOSAL COMMITTEE.

At the last conference of State and territorial health authorities with the United States Public Health Service a resolution was adopted recommending the appointment by the service of a sewage-disposal committee for the purpose of standardizing methods for the sanitary disposal of human excreta in rural districts. Prof. C. W. Stiles was made chairman of the committee.

#### INVESTIGATIONS OF POLLUTION OF STREAMS.

##### OHIO RIVER.

Extensive studies of the problems associated with the pollution of navigable waters were first begun by the service in 1913, and work was started on the Ohio River in July of that year, headquarters being established in Cincinnati. The object of the studies has been not only a study of pollution conditions as existing in the Ohio River, but more especially a quantitative analysis of the various factors concerned in the pollution and self-purification of streams in general. In addition to extensive and intensive laboratory investigations of the degrees and types of pollution, including exhaustive bacteriological, chemical, and biological (plankton) examinations, consideration was given to the coordination of these findings with the general status of public-health conditions in the communities situated on the main river and its tributary drainage systems. Comprehensive sanitary surveys have been made of all cities, towns, and communities of any importance located on the Ohio River watershed, with special reference to the effects of stream pollution upon public health.

During the past year the work carried out in relation to these studies has consisted mostly of the preparation of the data for publication. Practically the entire personnel previously engaged in the field studies were recalled about July 1, 1917, for duty in connection with the establishment of extra cantonment zones. The force, however, has been available for the making of surveys of water supplies throughout the country, but especially in connection with military camps.

##### ATLANTIC WATERSHEDS.

In order to assemble extensive data for comparative studies of various river systems surveys and to determine the public health consequences of stream pollution in a broader area than that included in the Ohio River watershed, these studies were extended to include the drainage areas tributary to the Atlantic Ocean in New Jersey, New York, and the New England States. Special attention was given to the usual factors responsible for the prevalence and spread of typhoid fever, including the effect of pollution of streams, and extensive data were collected on the character and extent of pollution of streams by industrial wastes. In June, 1917, similar sur-



veys were started in the States south of the Potomac and east of the Mississippi Rivers, but in about one month had to be discontinued because of the necessity for personnel in connection with the establishment of civil sanitary districts around military camps.

#### SANITARY SURVEY OF DES MOINES RIVER WATERSHED.

Sanitary Engineer H. R. Crohurst was detailed on October 20, 1917, to make a sanitary survey of the pollution of the Des Moines River between Des Moines and Humboldt, Iowa, and its effect on the public health. Considerable work in the investigation of the pollution of the Des Moines and Raccoon Rivers had already been made by the officer in charge of the extra cantonment zone at Camp Dodge, Iowa, and the survey supplemented that investigation. Although the water of the river is not used for water supplies, bathing is general and ice is harvested from the river. This ice is supposed to be used only for refrigeration purposes, but some no doubt finds its way into domestic use. The points of sewage discharge were found to be at comparatively long distances apart, and as a result the sewage produces very little effect on the streams. However, in view of the increasing number of soldiers stationed at Camp Dodge, and the danger of serious pollution of the river in the city of Des Moines, it was recommended that regular and systematic chemical and bacteriological examinations be made near bathing beaches and ice houses in that city.

#### WATER SUPPLY, PETERSBURG, VA.

An investigation of the water supply of Petersburg, Va., was made under the direction of Prof. E. B. Phelps. The observations and recommendations made in regard to the filtration plant were of especial importance, due to the fact that this supply was furnished under contract to Camp Lee, Va., and constituted the only water supply of that cantonment.

#### WATER SUPPLY OF UNITED STATES INTERNMENT CAMP, HOT SPRINGS, N. C.

Prof. E. B. Phelps, of the Hygienic Laboratory, was detailed on September 7, 1917, to investigate the water supply of the United States internment station, Hot Springs, N. C.

The town water supply was found insufficient in quantity to serve the camp with its anticipated population of approximately 2,000.

A supply of ground water from infiltration wells was utilized on recommendation of Prof. Phelps.

#### POLLUTION OF COASTAL WATERS.

In 1914 studies of the pollution of the Potomac River, with special reference to its shellfish-bearing areas and bathing beaches, were extended to Chesapeake Bay and later to other coastal waters. Up to the present time these studies have included most of the coastal waters of Maryland, Virginia, New Jersey, Delaware, New York, Connecticut, and Rhode Island.

The studies have taken the following form:

1. A sanitary survey of the drainage area of the waters studied, with their tributaries, the survey including—

- (a) Character and amounts of sewage and wastes discharged into the waters.
- (b) Population on the watershed.
- (c) A study of the direction and velocity of currents and tides with reference to their effect on the pollution of certain areas and on the time factor in purification.
- (d) A study in detail of sanitary conditions in the vicinity of the shellfish beds and of the water in which they were situated.

2. The bacteriological examination of samples of oysters and water from the areas investigated.

3. Chemical examinations for the determination of dissolved oxygen, etc.

4. A study of the amount and seasonal prevalence of typhoid fever in the communities adjacent to the waters investigated, with special reference to ascertaining what proportion, if any, of such cases were due to bathing in polluted water or to the ingestion of infected shellfish from such waters.

Detailed reports of the various studies have been made, in order to give information to health authorities and others of insanitary conditions.

#### PERSONNEL.

Just prior to the end of the last fiscal year the personnel engaged in the work was reduced through the national emergency arising from the war, and all new work not already started was held in abeyance. Surg. H. S. Cumming, previously in charge of the studies, was relieved, and Surg. F. A. Carmelia was continued in temporary charge. With the opening of the present fiscal year the personnel included Dr. Carmelia, Sanitary Engineer C. N. Harrub, Assistant Sanitary Engineer Sol Pincus, Temporary Scientific Assistant Louis F. Krumrein, an office clerk, one laboratory attendant, and the crew of the laboratory steamer *Murray*. Later Assistant Sanitary Engineer Pincus, Sanitary Engineer Harrub, and Sanitary Bacteriologist C. H. Spalding were all relieved for extra contonment work.

#### NARRAGANSETT BAY.

From July to December, 1917, investigation of the pollution of the waters of Narragansett Bay was continued. In March and April, 1918, additional data were gathered. Although the work was restricted because of war activities, about 80 per cent of the field work was completed at the end of the fiscal year. When the study is finished, a report giving the conclusions reached will be prepared for publication.

#### INDUSTRIAL WASTES.

Studies of tannery, strawboard, creamery, and canning wastes, previously conducted under the general direction of Prof. E. B. Phelps, Chief of the Division of Chemistry, Hygiene Laboratory, were post-

<sup>1</sup> Added to the force in August, 1917.

poned because of the war situation. The results of previous studies were prepared for publication, and a bulletin dealing with the treatment and disposal of strawboard waste and the determination of biochemical oxygen demand of industrial wastes and sewage has been sent to press.

#### SEWAGE DISPOSAL.

Investigations of sewage disposal have been under the general supervision of Prof. Phelps. Systematic studies were necessarily discontinued owing to the necessities of work more closely connected with the war; but studies of sewage disposal problems in certain cities were made on request of State and local authorities.

##### PROPOSED SEWAGE DISPOSAL SYSTEM, CLEVELAND, OHIO.

In July, 1917, the Ohio State health authorities requested the assistance of the Public Health Service in passing upon certain plans submitted by Cleveland, Ohio, for the treatment of a portion of the sewage of that city. Prof. E. B. Phelps was detailed to make a study of the situation and make a recommendation in regard to these plans. The plans involved the use of Riensch-Wurl screens for the removal of suspended solid matter. The question was deemed important inasmuch as it involved a precedent in the matter of standards for sewage treatment on the Great Lakes and might, in fact, affect the work of the international joint commission in its dealings with problems of transboundary pollution. After studying the situation, Prof. Phelps was of the opinion that the proposed process of screening ought not to be approved.

##### SEWAGE DISPOSAL PROBLEM AT WACO, TEX.

At the request of Passed Asst. Surg. R. A. Herring, in charge of the extra cantonment zone at Camp McArthur and the State and local authorities, Sanitary Engineer R. E. Tarbett was detailed on November 28, 1917, to confer at Waco, Tex., in regard to a proposed sewage disposal plant. Mr. Tarbett found that the condition of the Brazos River, due to the discharge of the sewage of Waco, was such that a sewage disposal plant for the city was an immediate necessity. His investigation also indicated that the most suitable type of plant for Waco would be the Imhoff-Tank-Sprinkling Filter type and that it would cost about \$225,000. In the investigation Mr. Tarbett was assisted by Mr. M. V. Ehlers, sanitary engineer of the Texas State Board of Health.

##### COOPERATION WITH BUREAU OF CHEMISTRY.

Cooperation with the Bureau of Chemistry, Department of Agriculture, was continued, Surg. M. V. Glover being detailed to that bureau as in the previous fiscal year for the enforcement of the Sherley amendment to the food and drugs act of 1906.

##### LEPROSY INVESTIGATION STATION.

Leprosy work has been carried on at Kalihi, Hawaii, during the year. Surg. Donald H. Currie continued as director until July 26, 1917, on which date Acting Asst. Surg. H. T. Hollman was placed in temporary charge.

## LABORATORY STUDIES.

*Cultural studies.*—The acid fast bacillus, morphologically like the bacillus of leprosy, was cultivated from the leprous tissue of a number of patients under treatment.

Numerous attempts at the cultivation of the rat leprosy bacillus were also made.

*Animal inoculations.*—The results of animal inoculations with the cultures as well as with the leprous tissue have always proved negative at this station.

During the year it was found that the leprous tissue inoculated was absorbed entirely without involvement of any of the internal organs. The bacilli were found to have been taken to the nearest lymphatic glands and there eventually destroyed.

The strain of rat leprosy used at this station for animal inoculation has required about 12 months to produce well-marked clinical rat leprosy. About 66 $\frac{2}{3}$  per cent of the inoculated rats developed the disease.

Necropsy on rats dying of rat leprosy during the year has failed to show any other lesions than those of the skin and lymphatic glands.

## CLINICAL STUDIES.

*Chaulmoogra oil.*—The majority of the patients received chaulmoogra oil and Lugol's Iodine Solution internally, 20 c. c. of the oil and 8 c. c. of the iodine solution daily.

With the assistance of Dr. A. L. Dean, professor of chemistry at the College of Hawaii, four different fatty acid fractions from chaulmoogra oil were isolated and, in the form of ethyl esters, were administered intramuscularly, with the most encouraging results.

Trichloroacetic acid applied locally to the leprous lesions has been found to be superior to the carbon dioxide snow. Its application is not nearly so painful, and the subsequent inflammatory reaction is more marked. It causes the lesions to disappear more rapidly than the previously used carbon dioxide snow, and if continued long enough, there is complete disappearance of the acid fast bacilli in the part cauterized.

*Sunlight treatment of leprous ulcerations.*—During the past year, heliotherapy has been practiced in those intractable ulcerations of the skin that so frequently occur in cases of leprosy in which the nerve involvement is marked.

All ulcerations of the skin due to neurotrophic involvements with no necrosis of bone when exposed to sunlight have healed.

It has also been observed that the exposure to the sunlight has had a marked tonic effect on the entire system.

*Surgical treatment.*—During the year 14 surgical operations were performed under general anesthesia; 2,030 surgical dressings were applied under the supervision of the station officers.

## HYGIENIC LABORATORY.

*Personnel.*—Surg. George W. McCoy has continued as director. At the close of the fiscal year 92 persons were attached to the laboratory, as follows:

The director, assistant director, 11 commissioned officers, 2 pharmacists, 3 professors, 6 technical assistants, 1 artist, 1 executive clerk, 1 pathologic physiologist, 2 physiological chemists, 3 organic chemists, 2 assistant chemists, 3 assistants in chemistry, 3 sanitary engineers, 1 assistant sanitary engineer, 1 physiologist, 1 pharmacologist, 1 bacteriologist, 6 sanitary bacteriologists, 4 special experts, 1 laboratory aid, 1 bacteriological technician, 7 clerks, and 29 attendants.

Owing to the uncertainties of war conditions considerable difficulty was experienced during the last fourth months of the year in securing and keeping various members of the scientific staff. A number now on the roll have accepted appointment at financial loss, in order that the Government might use their services in this time of national emergency.

It has been necessary to increase the pay of the attendant force materially to meet advancing prices of labor and family maintenance.

*Aid to other institutions.*—The rapid growth of military operations has resulted in a multitude of calls on every division of the laboratory for information and assistance, as well as a large amount of new work bearing on war activities. The aid extended was given not only to governmental agencies, but to private institutions engaged in essential work. Notable among the latter are manufacturers of serums, toxins, vaccines, and analogous products, and of arsphenamine.

The increased use of therapeutic products by the military forces and in extracantonment zones has necessitated a corresponding growth in the amount of work connected with check examinations and standarization. This work had been largely foreseen and preparations made accordingly.

Various State and educational institutions were given assistance, chiefly in the form of advice and material for instruction and testing purposes. The latter comprises 531 cultures sent out. No culture left the laboratory without definite information as to its recipient and the purpose for which it was desired. A large number of requests for cultures were refused because the State authorities could not vouch for the applicants.

All institutions, whether public or private, operating for the national welfare were encouraged to call upon this service station for aid, which was always extended with the least possible formality.

A number of public health and technical workers have been given the facilities of the laboratory for short intervals.

*Field investigations.*—The laboratory work connected with the numerous field investigations conducted by the service has largely been done at this station. Facilities and equipment have been enlarged to meet the demands of workers, and adjustments have been made to take care of emergency calls for extracantonment and other stations. Routine work has been promptly disposed of and new problems have received systematic attention. A plan of weekly conferences of staff members working on special investigations has been adopted with good results.

*Journal club.*—The method of handling current medical literature by means of reviews at biweekly meetings of the commissioned per-

sonnel has been continued. Special subjects are sometimes announced in advance for discussion and the officers are expected to prepare themselves accordingly. The meetings are held outside of Government hours so as not to interfere with laboratory work. The school of instruction formerly held for the benefit of officers was discontinued temporarily because of important war work.

#### DIVISION OF PATHOLOGY AND BACTERIOLOGY.

The work of this division has taxed the personnel to the utmost. The principal lines of investigation have been as follows:

*Epidemic cerebrospinal meningitis.*—The largest problem undertaken during the year was the grouping of organisms isolated from cases of epidemic meningitis. This subject is being approached from biological and serological viewpoints and thus far has not yielded results of a definite nature.

*Tetanus.*—Early in the year the problem of the detection of tetanus infection in court plaster was studied. It was found that a considerable proportion of the court plaster on the market harbored tetanus spores; not a very surprising result if one will recall that gelatin, which has long been recognized as a habitat of tetanus organisms, enters into the composition of court plaster.

Late in the year the laboratory undertook the study of the presence of tetanus in shaving brushes and methods for disinfecting these articles.

It has been proved that some brushes, especially those made from horsehair, are likely to be contaminated with anthrax spores. This contamination accounts for a number of cases of facial anthrax that have occurred in the military posts.

As a result of these studies the quarantine regulations, both foreign and domestic, were amended so as to prohibit the sale of brushes made from material that has not been disinfected by means of steam or by boiling.

*Effect of freezing on typhoid and diphtheria organisms.*—A short investigation was made to determine the longevity of the typhoid bacillus and the diphtheria bacterium in ice cream. The results indicated that these organisms could live long enough in this food product to make it a definite source of danger if contaminated. The work grew out of an investigation of an epidemic of diphtheria at Newport, R. I., where the infection was with reasonable certainty shown to be distributed by infected ice cream.

*Antienteric vaccine.*—The manufacture of antityphoid vaccine has increased enormously, a total of 347,129 c. c. having been made and distributed during the year. There has been considerable demand also for a triple vaccine which combines *B. typhosus*, *B. paratyphosus* A and *B. paratyphosus* B. This vaccine gives rather severe reactions and probably will not be very popular among the civilian population. A total of 27,146 c. c. of this product was distributed. Inoculations at the laboratory were as follows: Typhoid vaccine, 563; triple, 52; total, 615. Total vaccine produced, 374,275 c. c.

*Pasteur treatment.*—Forty persons received Pasteur treatment at the laboratory and material for 2,032 treatments was sent to State

and Federal authorities for administration. The following table shows the geographic distribution:

Sent to—	Treatments.	Sent to—	Treatments.
Alabama.....	427	Oregon.....	13
Arkansas.....	124	Panama Canal.....	12
Colorado.....	17	Porto Rico.....	22
Connecticut.....	6	Rhode Island.....	3
Delaware.....	15	South Carolina.....	16
Georgia.....	49	Tennessee.....	163
Idaho.....	26	Utah.....	32
Illinois.....	60	Virginia.....	44
Iowa.....	38	Washington.....	118
Kansas.....	23	West Virginia.....	4
Kentucky.....	84	Wisconsin.....	6
Maryland.....	20	Military forces.....	41
Massachusetts.....	23		
Mississippi.....	177	Total sent out.....	2, 032
Missouri.....	2	Treated at laboratory.....	40
Nevada.....	129		
North Carolina.....	335	Total.....	2, 072
North Dakota.....	3		

*Examination of specimens.*—The following specimens were received at the laboratory for examination, in addition to biological samples and various material received for research purposes:

**Blood:**

Wassermann test—

Positive.....	356
Negative.....	1, 065
Anticomplementary.....	32
Not satisfactory.....	36
	1, 489

Malaria.....	4
Widal.....	8
Count.....	6

	1, 507
Spinal fluid (for Wassermann test), all negative.....	13
Feces.....	214
Urine.....	36
Sputum.....	21
Tissues.....	37
Water.....	279

Animal heads examined for rabies:

	Positive.	Negative.	Decomposed.	Total.
Dog.....	64	41	16	121
Cat.....	9	6	2	17
Cow.....	3	2	0	5
Hog.....	1	1	0	2
	77	50	18	145

Miscellaneous specimens.....	145
	686

Total..... 2, 937

The miscellaneous specimens include a large number received from various sources (principally intelligence officers) to be examined for evidence of poison, glass, and infection. All such specimens were made "special," and the results were reported without delay. They cover a wide range of objects: Articles of food, court plaster, gauze and bandages, chewing gum, soap, wearing apparel, etc.

A number of specimens of various alleged remedies were received. It was evident that in a number of instances the senders desired official indorsement for purposes of advertising.

#### DIVISION OF PHARMACOLOGY.

Prof. Carl Voegtlin has continued in charge of the Division of Pharmacology.

The nature of the work was modified and enlarged so as to contribute as much as possible to the solution of problems arising from the present war.

*Nutritive value of various kinds of flour and bread.*—An extensive investigation covering a period of nearly two years has shown that highly milled flour and bread made from this flour are considerably inferior in vitamine content to the "low extraction" flours now so extensively used in European countries. This conclusion was reached from well-planned feeding experiments on animals, in which all extraneous and complicating factors were eliminated. One of the main objections against the "low-extraction" flour, namely, its excessive cellulose content, could easily be overcome by a method of milling which would permit the elimination of a greater part of the bran.

Similar results were also obtained in experiments with corn products. The details of these investigations were published in the Public Health Reports.

*Influence of heat on the vitamine content of beef.*—This investigation, referred to in last year's report, has been completed and a manuscript reporting the results was submitted for publication. The work has conclusively shown that under ordinary conditions beef does not lose any of its vitamine content when heated for three hours to 120° C. This observation is of considerable value in relation to the canning of meat, as numerous statements in the literature are to the effect that canned beef is not as nutritious as fresh beef. Similar experiments on the effect of heat on milk have not yielded clean-cut results. It appears, however, that milk heated for three hours in an autoclave at 120° C. does not lose a considerable part of its accessory foods (vitamines).

*Chemical isolation of antineuritic vitamins.*—Work along this line was continued part of the year, when more pressing problems interfered with its continuation. Several technical papers on this subject were published in scientific journals.

*Standardization of pituitary extract.*—Recent work on this subject has led to the discovery of a new and perhaps ideal standard for the biological assay of the active principle derived from the posterior lobe of the pituitary gland. The new standard, potassium chloride, has the great advantage of permanency and chemical uniformity and if adopted by manufacturers would undoubtedly lead to the marketing of pituitary preparations of constant physiological activity and therapeutic value. A manuscript reporting this work has been submitted for publication.

*Standardization of arsphenamine, etc.*—The work conducted at the Hygienic Laboratory in regard to arsphenamine will be found reviewed on page —.

*Tríkresol as a preservative for antipneumococcic serum.*—This investigation was concluded and has shown that it is safe to use



trikresol in the concentration of 0.3 to 0.5 per cent for the preservation of antipneumococcic serum. A Hygienic Laboratory bulletin reporting these experiments is in press.

*Effect of drugs on the respiratory center.*—By means of a newly devised spirometer a number of drugs have been studied in regard to their action on the response of the respiratory center to increasing concentrations of carbon dioxide. Among the drugs having a depressing effect may be mentioned, general anaesthetics, morphine, codeine, and heroin. Caffeine was the only drug which was found to have a marked stimulating action.

*Digest of Comments on the United States Pharmacopoeia and National Formulary.*—A manuscript for the Digest for the year ending December 31, 1915, has been submitted for publication some time ago but owing to the congested conditions at the Government Printing Office has not appeared in print. Work on the Digest for the year 1916 is well under way.

*Control of the traffic in habit-forming drugs.*—In cooperation with the Bureau of Internal Revenue, a member of the division spent considerable time in work and conferences aiming at the reduction of the number of drug addicts in this country. This subject deserves considerable and careful attention.

*Aid to other departments of the Government.*—In connection with the control of arsphenamine and its substitutes numerous samples of this drug were tested for the Federal Trade Commission, the Bureau of Chemistry of the Department of Agriculture, the Surgeon General's Office of the Army and of the Navy.

Assistance of a varying nature was given to the Bureau of Internal Revenue and the Bureau of Mines. Samples of drugs were examined for the purveying depot of the service. Numerous samples of foodstuffs submitted by officers of the service were examined for the presence of poisonous contaminations.

#### DIVISION OF ZOOLOGY.

Prof. C. W. Stiles has remained in charge of this division, although he has been on duty elsewhere during most of the year.

*International Commission on Zoological Nomenclature.*—Owing to the facts that the chief of the division, who is also secretary to the commission, was occupied with war problems, and that his assistant resigned to take another position, very little nomenclatorial work was accomplished.

*Index catalogue of medical and veterinary zoology.*—In October the manuscript of the Nematode Catalogue, consisting approximately of 4,480 pages, was finished and forwarded for publication. This catalogue, together with its two companions, the Cestode and Trematode Catalogues, places the parasitic worms on an entirely new foundation for future work. Heretofore it has been difficult for authors to trace the complete literature and the various genera and species described.

The material for the Host Catalogue has been collected. The sections on trematodes and cestodes and the greater part of the section on nematodes have been typewritten.

*Examination for determination of intestinal parasites of man.*—This part of the routine work of the division has been continued throughout the year. Specimens have been examined for the United

States Army, United States Navy, National Training School for Boys, and for various State boards of health and practicing physicians.

Prof. Henry B. Ward, of the University of Illinois, has recently reported the first recognized case of the presence of *Gongylonema* as a parasite of man. Another case of infection of man by this same nematode has been determined by the Division of Zoology.

*Specimen collection.*—The specimen bottles have been freshly filled and arranged under a new system of classification. Cards were made for each bottle, for the collection had grown until there had been some difficulty in locating specimens. This work also included the collection for which Dr. Stiles is curator at the New National Museum.

*Fauna of sludge.*—Studies in regard to the fauna of sludge were carried on until November.

#### DIVISION OF CHEMISTRY.

Prof. E. B. Phelps has continued in charge of this division.

*Detection of small quantities of poisonous gases in the atmosphere.*—During the early part of the year the activities of the division were seriously curtailed by reason of the necessity for rather extensive field details of members of the divisional staff. Work under way at that time upon the examination of air for the detection of minute quantities of various deleterious substances was, however, continued as a matter having distinct war interest. Exact methods for the measurement of small quantities of anilin and nitro-benzene have been developed, and the first of these published. This investigation was later merged with the T. N. T. investigation, with which it is closely associated. (See p. 41.)

*Possibilities of central milk pasteurizing plants.*—In connection with service activities at Newport News, the importance of milk pasteurization led to the study of the possibilities of a central pasteurizing plant for that city. Mr. A. F. Stevenson, who had already made similar studies for Tuscaloosa, Ala., was assigned to this study and has prepared complete plans and in part supervised the installation of this pasteurizing plant. The plant at this time is complete and in operation under the general supervision of the Public Health Service.

*Demonstration of possibilities of reconstructed milk.*—A similar need for a satisfactory milk supply having arisen at the Government powder plant at Nitro, W. Va., plans were originally prepared for a pasteurization plant, but it was later decided to undertake at that point a demonstration of the possibilities of reconstructed milk. It has been found entirely feasible upon a small scale to prepare a milk of satisfactory physical characteristics and of most excellent sanitary quality from dry skim milk powder, butter fat, and water. Although the process as a whole has not hitherto been carried out upon a large scale in the preparation of a market milk, yet both the homogenizing of butter fat for the preparation of cream and the use of dry milk powder have become established practices. There remains, therefore, only the demonstration of the practicability of preparing market milk in this way, and in view of the great difficulties in the way of securing a proper milk supply for Nitro, the situation seemed especially favorable for making this demonstration. The study thus far has entailed several trips of inspection to milk pow-

der plants and a considerable amount of work in preparing specifications for mechanical equipment. The machinery has now all been ordered and is being installed.

*Routine work.*—The routine work of the division has comprised the preparation of manuscripts and reports, especially the report upon the Ohio River investigation. The final report of sewage investigations has been edited and prepared for publication, and two industrial waste reports, namely, one upon the disposal of strawboard wastes and the other upon the disposal of tannery wastes, have been similarly prepared. Four sets of examination papers have been corrected for the United States Civil Service Commission, a list of laboratory equipment prepared for the ordnance base of the Army in France, an examination and report made upon an aluminum canteen for the Quartermaster Department, United States Army, and routine samples of Potomac River water examined for the engineer of sewers, District of Columbia. Special examinations have been made for the supervising engineer at Camp Meade and for other divisions of the laboratory.

### VIRUSES, SERUMS, TOXINS, AND ANALOGOUS PRODUCTS.

#### ENFORCEMENT OF LAW.

In the enforcement of the law of July 1, 1902, regulating the sale of viruses, serums, etc., regular inspections of all establishments were made. One establishment was granted license for the first time. In five cases licenses were refused. Seven licenses were suspended. At the termination of the fiscal year 29 establishments (22 American and 7 foreign) were holding licenses. The complete list has been published in the Public Health Reports of May 31, 1918, and also issued as Reprint No. 469.

A total of 9,344 samples of products were examined at the Hygienic Laboratory during the past fiscal year, as against 5,506 samples in 1917, 5,187 in 1916, 3,102 in 1915, and 1,113 in 1914. Following is a detailed statement of tests made in the past fiscal year:

#### Products:

Sterility tests—		Samples examined.
Diphtheria antitoxin	-----	106
Tetanus antitoxin	-----	53
Other sera	-----	697
Vaccine virus	-----	572
Rabies vaccine	-----	567
Tuberculin	-----	96
Bacterial vaccines	-----	6, 191
Sensitized bacterial vaccines	-----	56
Miscellaneous products	-----	101
		<hr/> 8, 439
Potency tests:		
Diphtheria antitoxin	-----	86
Tetanus antitoxin	-----	55
Antidysenteric sera	-----	35
Antimeningococcic sera	-----	251
Antipneumococcic sera	-----	231
Vaccine virus, on monkeys	-----	127
Vaccine virus, on rabbits	-----	46
Typhoid vaccine	-----	74
		<hr/> 905

Total ----- 9, 344

During the past year this work has occupied the full time of two medical officers and three sanitary bacteriologists, together with clerical and nontechnical assistants as required. The work has grown very much on account of war conditions by reason of the adoption of a new procedure in controlling antimeningococcic, antipneumococcic, and antidysenteric serums.

During the year two inspections have been made of practically all establishments manufacturing biological products, as it is felt the stress under which all were working demanded closer supervision than that afforded by the annual visit of the official inspector.

#### VACCINE VIRUS.

The occurrence of several cases of tetanus which, epidemiologically, were associated in a suspicious manner with the product, dispensed on "ivory" points, of a single manufacturer led to the recommendation for the promulgation of an order prohibiting the use of points for dispensing vaccine virus. A rather extensive investigation showed that the ivory points as they reach the vaccine manufacturer frequently were contaminated with tetanus spores and that, where disinfection measures were inadequate, the contamination might be carried through to the finished product. In connection with this work a standardized technique of testing vaccine virus for anaerobic contaminations has been worked out and is now being employed tentatively by a number of manufacturers.

#### ANTIMENINGOCOCCIC, ANTIPNEUMOCOCCIC, AND ANTIDYSENTERIC SERUMS.

In accordance with a department ruling all lots of these three serums are required to be submitted to the Hygienic Laboratory for testing before the material is distributed by the manufacturers. Serological tests are employed for determining the probable potency for antimeningococcic and antidysenteric serums, while the mouse protection test is used for the antipneumococcic serum. On account of the irregularities in the results of these tests it is desirable to have the control centered in one laboratory and to have duplicate tests made rather than to hold the manufacturer alone responsible for the testing.

These three serums are now dated by the manufacturer not to exceed six months after being removed from cold storage. This comparatively short time limit was recommended on account of the lack of knowledge of the rate of deterioration of these serums under commercial conditions. Through the medical departments of the Army and Navy large numbers of samples of antipneumococcic and antimeningococcic serums have been received for testing. So far as these products are concerned, this serves the same purpose as the open-market purchase of samples which has been practiced in previous years.

#### GAS GANGRENE ANTITOXIN.

Toward the end of the fiscal year evidence came to hand which made it desirable to provide, for prophylatic use in the military service, an antitoxin against not only tetanus but also the organisms

causing gas gangrene. In June conference was held with manufacturers and with representatives of the Medical Department of the Army at which arrangements were made looking to the testing and standardization of such products. There appears to be reasonably satisfactory clinical evidence that such a mixed antiserum has a field of usefulness for prophylactic purposes in connection with the wounds of war.

#### PREVENTION OF IMPROPER USE OF VIRULENT PATHOGENIC ORGANISMS.

Impressed with the need of taking every possible precaution to prevent the improper use of virulent pathogenic organisms which might fall into the hands of ill-intentioned persons, identical circular letters covering this point were sent out by the service to State and local board of health laboratories, medical colleges, and biological product establishments, and by the Bureau of Animal Industry to university laboratories, agricultural colleges, and other institutions related to the work of the Agricultural Department.

#### CONTROL OF MANUFACTURE OF ARSPHENAMINE.

The Federal Trade Commission on November 30, 1917, issued orders for licenses to manufacture and sell the product heretofore known under the trade names of "Salvarsan," "606," "Arsenobenzol," and "Arsaminol." The drug was to be sold under the name of "Arsphenamine." Rules and standards for the manufacture and sale of the product were prescribed by the service and were promulgated by the Federal Trade Commission. The manufacturer was required to test his product by means of methods developed at the Hygienic Laboratory. Later these rules and standards were amended and additional rules and standards issued to cover neoarsphenamine.

At the end of the fiscal year four firms held licenses for the manufacture of these products. Several hundred samples of the products were examined at the Hygienic Laboratory under a ruling requiring the submission of samples from each lot manufactured.

Control of the manufacture of arsphenamine was made possible through studies conducted at the Hygienic Laboratory for the purpose of discovering a satisfactory method for the toxicological and chemical standardization of the drug. These were commenced in the previous year and brought to a successful end during the last fiscal year. The work done on the chemical standards was published in the Public Health Reports of June 21, 1918. A manuscript dealing with the toxicological side is in press.

An investigation was begun at the laboratory to determine the cause of death sometimes following the administration of this drug to patients. The main object of this work is (1) to yield further information which might be of value in the standardization of arsphenamine and (2) to devise means for the prevention as well as treatment of arsphenamine poisoning in patients treated with this drug. A detailed analysis of the pharmacological action of arsphenamine is now under way and the results promise to be of value in the treatment of untoward symptoms following injection of the drug into the human being.

Surplus amounts of samples of arsphenamine received from manufacturers and not needed at the laboratory for chemical or toxicity tests have been used at the different stations of the service. These stations have made reports as to the results obtained and the records have been incorporated with the laboratory record of the same samples.

A thorough pharmacological study is now in progress at the laboratory involving (1) the intermediate compounds used in the manufacture of arsphenamine and (2) compounds of abnormal toxicity which might enter into the composition of the final market product. It is hoped that these studies will lead to improvements in the rather difficult manufacture of this drug.

#### CONFERENCE WITH STATE AND TERRITORIAL HEALTH AUTHORITIES.

The sixteenth annual conference of State and Territorial health authorities with the United States Public Health Service was held in Washington, D. C., on June 3-4, 1918. The following subjects were among those discussed:

Sanitation of extra-cantonment areas, especially as related to the work of State and local health authorities.

The venereal diseases.

Better control of communicable diseases and disease carriers, especially in the case of cerebrospinal meningitis and typhoid fever.

Use of records of drafted men for public-health purposes.

Relation to public health of industrial hygiene and sanitation, especially in war industries.

Care of tuberculous soldiers and relation to the public health, especially after their return to civil life.

Trachoma and its bearing on the public health of the military forces.

Hookworm disease: The importance of its prevalence and control among the military forces.

Effects on the public health of the forthcoming shortage in the medical profession.

Better morbidity reports: How to secure them.

Railroad water supplies.

Pellagra.

Committee reports were made in regard to morbidity returns, sanitation of public conveyances, rural sanitation, and trachoma.

The proceedings of this conference will be published by the service. The resolutions which were adopted were published in the Public Health Reports for June 14, 1918.

#### REPRESENTATION AT MEETINGS OF SCIENTIFIC AND SANITARY ASSOCIATIONS AND CONGRESSES.

As in the past, the service was represented by one or more officers at a large number of annual and other meetings of scientific or sanitary associations and congresses. In most cases the representatives read papers relating to public health, and in all acquired information of scientific or sanitary importance to the work of the service.

#### DISSEMINATION OF INFORMATION.

In order that the results of investigations shall accomplish their purpose, it is necessary to disseminate them through proper channels. Among the means taken to this end are: (1) Personal interviews with

health authorities following particular studies within their jurisdictions, (2) publications, (3) other reports, (4) posters, (5) lectures, (6) press service, (7) exhibits, and (8) correspondence.

*Interviews and conferences.*—Inasmuch as many investigations are undertaken on the request of State and local authorities to meet an emergency, the results of investigations are frequently made known verbally as soon as obtained and advice given based on these data, so that remedial action may be immediately taken. Advantage is frequently taken also of situations to advise not only the health authorities but the mayors and councils of cities and, at times, the executives and legislative bodies of States.

*Publications.*—Monographs on sanitary subjects are regularly issued in the weekly Public Health Reports, in reprints of these reports, and in special publications, such as Public Health bulletins and Hygienic Laboratory bulletins. In these publications a large number of the investigations considered above are reported, as well be seen by reference to the report on publications, page 324.

*Other reports.*—In some cases reports of investigations are submitted to the authorities in typewritten form.

*Posters.*—A poster describing methods of preventing malaria was issued and mailed to post offices and railroad stations throughout portions of the country where the disease is prevalent.

*Lectures.*—In addition to papers read at meetings of scientific or sanitary associations, opportunity is taken of the presence of officers in the field to give popular addresses. By this means not only is information of local interest conveyed but the activities of the Public Health Service are brought directly to the attention of the public generally. In some cases courses of lectures on public health have also been given by officers of the service.

*Press service.*—Brief abstracts of all publications issued have been furnished regularly for dissemination to the newspapers of the country. Periodical statements of the work of the division have been prepared for the press.

*Exhibits.*—Some of the results of scientific investigations have also been made public by the Division of Domestic Quarantine by means of exhibits and stereopticon slides.

*Correspondence.*—A large number of replies are made to letters requesting information of a hygienic or public health nature.

## DOMESTIC (INTERSTATE) QUARANTINE.

The work in extra cantonment zones and other areas for the protection of the health of the military forces has necessitated the concentration of the energy of this division upon this problem. As a result, the work of controlling water supplies used by interstate carriers has been hampered and its personnel and equipment diverted to some extent to the larger problem. Laboratory cars have been temporarily used to combat epidemics in extra cantonment zones and have proved of great value for this purpose. Control has been maintained, however, over the sources of supply and the best measure of protection given which has been possible under the circumstances.

The plague suppressive measures at New Orleans have been continued, but at the expiration of one year in April, 1918, from the finding of the last plague-infected rat it was deemed possible to greatly reduce the work with safety, and it may be entirely discontinued within a few months.

The eradication of plague and ground squirrels in California is an exceedingly difficult problem. Work has continued in this field throughout the year, and while eradication has not been accomplished it has been possible to control the spread of the disease. An index of infection is secured by shooting over the infected area, and upon the finding of a focus infection the intensive work of eradication is concentrated upon a limited area surrounding the focus.

Certain phases of the work of the division have received particular stress and the most gratifying results have obtained. The Public Health nursing campaign, continuing as it has for but a few months during the year, has succeeded in awakening the attention of the civil and military authorities throughout the country. The investigation begun in regard to the control of venereal diseases has already resulted in the furtherance of a program which has met with the hearty cooperation and approval of the authorities, and has resulted in an awakening of the general population throughout the country to the seriousness of the disease and a knowledge of the fact that it should be placed upon the same basis as any other communicable disease.

## PLAGUE SUPPRESSIVE MEASURES IN CALIFORNIA.

Plague suppressive measures in the State were under the supervision of Passed Asst. Surg. C. L. Williams until August of the fiscal year ending June 30, 1918. At this time Surg. W. C. Billings assumed charge of operations, with the Interstate Sanitary Laboratory under the direction of Asst. Surg. W. T. Harrison.

## OPERATIONS IN SAN FRANCISCO.

During the present fiscal year the Public Health Service has, at the request of the department of health of the city of San Francisco,



continued to supervise the work performed by that department in connection with plague suppressive measures in the city itself. The force engaged in this work has been curtailed during the year, so that the volume of routine work is not so great as in former years. All rodents trapped were sent to the Federal laboratory, but no cases of infection were found.

The measures for rat extermination were conducted along the following lines: (a) Trapping, (b) poisoning, (c) elimination of rat food, (d) destruction of rat harbors, (e) installation of permanent rat-proofing in new and remodeled buildings, (f) killing rats on shipboard and the prevention of their escape from vessels.

During the year there were trapped and examined a total of 3,544 rats, none of which were found to be plague infected. The number by species was as follows:

<i>Mus norvegicus</i> .....	418
<i>Mus rattus</i> .....	989
<i>Mus alexandrinus</i> .....	2,137
Total .....	3,544

The close cooperation of the various agencies engaged in this work is shown by the following summarized statements:

**Trapping:**

Number of rats trapped.....	1,689
Number of rats found dead (including fumigated).....	1,947
Number of outside rats sent to laboratory.....	335
Number of rats sent to laboratory and examined.....	3,851
Number of fumigated rats.....	1,749

**Poisoning:**

Number of pounds of bacon.....	234
Number loaves of bread.....	1,429
Number pounds of poison.....	476
Number poisons placed (pieces).....	428,750

**Elimination of rat food:**

Number of complaints received.....	2,256
Number of complaints investigated.....	2,256
Number of premises inspected.....	32,033
Number of nuisances abated.....	3,682
Number premises rendered sanitary.....	773
Number garbage cans approved.....	20,071

**Destruction of rat harbors:**

Number of floors torn up.....	559
Number of yards and passageways torn up.....	40
Number buildings destroyed.....	231

**Rat proofing of buildings:**

Number food places applying for health officer's certificates, inspected and requirements sent.....	1,133
Number buildings rat proofed by concreting.....	818
Number buildings rat proofed by area walls and wire cloth.....	116
Number square feet of concrete laid.....	574,705
Number cubic feet of area walls installed.....	46,470

**Condemnation proceedings:**

Number buildings submitted to board of health for condemnation.....	153
Number buildings condemned.....	175
Number buildings not condemned.....	66
Number of buildings recommended for condemnation but not yet acted upon.....	10
Number of buildings condemned and remaining unabated.....	110
Number of buildings abated following condemnation proceedings <sup>1</sup> .....	199

<sup>1</sup> The officer states that the number includes some buildings condemned during previous years, hence totals will not balance.

## PRECAUTIONS TO FREE SHIPPING OF RATS.

The Public Health Service has had entire charge of this work in San Francisco, cooperating with the Quarantine Station by supplying and directing the inspection and trapping force operating on vessels in ports and wharves. This force also sees that vessels obey the quarantine regulations in regard to plague, and when necessary assists in fumigation of vessels. The following table summarizes the work accomplished:

Number of inspections made of vessels for rat guards.....	332
Number of vessels inspected for rat guards.....	137
Number of reinspections made of vessels.....	53
Number of new rat guards procured.....	123
Number of rats trapped on wharves and water front.....	1, 217
Number of rats trapped on shipboard.....	421
Average number of rat traps set on wharves and water front.....	260
Average number of rat traps set on vessels.....	82
Number of vessels trapped on.....	133
Number of times trapped on.....	513
Number of poisons placed on water front (pieces).....	81, 200
Amount of bacon used on water front and vessels (pounds).....	234
Amount of bread used in poisoning on water front (loaves).....	271
Poison used on water front (pounds).....	90
Number of vessels fumigated.....	457
Number of vessels searched for dead rats after fumigation.....	437
Number of dead rats taken from vessels after fumigation.....	1, 749

## OPERATIONS FOR THE ERADICATION OF PLAGUE AMONG GROUND SQUIRRELS.

In addition to the usual measures employed in the campaign, three specific occurrences of the year should be mentioned. After the establishment of Camp Fremont a service officer made a survey of the area involved in San Mateo County and reported that infestation was abundant. A force of 26 Federal, State, and county employees were concentrated on this work. The cantonment comprised 975 acres and the extra cantonment zone approximately 27,000 acres. A request was made by the chief sanitary officer, Western Department, United States Army, that the service eradicate ground squirrels from both camp and zone. Authority was received and eradication measures were undertaken jointly.

The work in this zone, beginning in August, was continued until November 30, when the camp was abandoned and the field workers assigned to other duty. The degree of infestation varied from nothing to 88 burrows per acre. The following table summarizes the work performed:

Number acres treated with poisoned grain.....	34, 513
Number acres treated with destructor and kilmol or carbon-bisulphide.....	4, 440
Squirrel holes actually treated (by above method).....	30, 930
Connecting holes filled.....	28, 050

At the close of the work a careful inspection covering a period of two days failed to reveal one live squirrel. This fact would evidently prove that it is better to concentrate activities upon a small area rather than to attempt less thorough measures over a larger area.

On November 1, 1917, the service delegated active charge of eradication work in Merced, Stanislaus, San Benito, and Monterey Counties to the State horticultural commission. On May 31, 1918, it was

deemed advisable to concentrate operations in the counties of Contra Costa, Alameda, and San Mateo for more thorough protection of the bay cities. On June 5 hunting operations were inaugurated to determine the areas in these counties which were most infected. Twenty-two plague squirrels were discovered and shot, as follows:

Contra Costa County.....	8
Alameda County.....	12
San Mateo County.....	2

These figures are not representative of the extent of the infection, for the reason that hunters were instructed to shoot over a certain area but once, send the squirrels to the laboratory, and proceed to the next area. No doubt upon discovery of a plague-infected squirrel others could have been found after hunting over the area in which the animal was found. This method was employed to determine the best standard as to which limited localities demanded immediate and intensive poisoning. The result obtained demonstrated both the continued presence of bubonic plague among ground squirrels and the difficulties encountered in accomplishing eradication. The situation still continues to constitute the same menace. The following report gives the result of the squirrel eradication work:

Number of inspections.....	2,957
Number of reinspections.....	11,033
Number of acres inspected.....	1,208,480
Number of acres reinspected.....	3,517,840
Number of acres treated with waste balls.....	89,402
Number of acres treated with destructors.....	3,240
Number of acres treated with poisoned grain.....	991,738
Number of acres treated with smoker tablets.....	100
Number of acres treated with Bunt's balls.....	1,405
Number of holes treated with Bunt's balls.....	16,425
Number of holes treated.....	680,957
Number of squirrels received at laboratory.....	10,064
Number of squirrels examined for plague.....	9,772
Number of squirrels infected with plague.....	32
Number of other animals examined.....	4
Number of other animals infected.....	0

#### AID TO OTHER DEPARTMENTS.

Various departments of the Government and other branches of the Treasury Department have been aided during the year by the cooperation at Camp Fremont and with the quarantine station and by laboratory work for the Immigration Service, various marine hospitals, the Army, the Navy, and the Indian Service.

#### INTERSTATE SANITARY LABORATORY.

A résumé of the work by the laboratory, together with certain data connected with water analysis, follows:

##### Blood for Wasserman reaction:

##### United States marine hospital—

San Francisco.....	1,255
Los Angeles.....	30
Port Angeles.....	1
Port Townsend.....	3
United States immigration station, Angel Island.....	8
United States Army, Fort McDowell.....	1

Total.....	<u>1,298</u>
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Cerrobrosphal fluid for Wasserman reaction, United States marine hospital, San Francisco-----	22
Mercurialized serum preparation, United States marine hospital, San Francisco-----	8
Organism identification:	
United States marine hospital, San Francisco-----	6
United States Immigration station, Angel Island-----	7
Tissue culture for gonococcus, United States marine hospital, San Francisco-----	1
Blood culture:	
United States Marine hospital, San Francisco-----	11
United States Army, Fort McDowell-----	2
Cerebrospinal culture for meningococcus, United States Marine Hospital, San Francisco-----	4
Widal reaction, United States Marine hospital, San Francisco-----	16
Sputum examination, microscopic, United States Indian Service, Valentine, Ariz-----	1
Guinea-pig inoculation for tuberculosis, United States Marine hospital, San Francisco-----	29
Feces examination for typhoid bacilli:	
United States Marine hospital, San Francisco-----	31
United States Army, Fort McDowell-----	3
Feces examination for hookworm ova, United States Marine hospital, Los Angeles-----	1
Bile culture for typhoid bacilli, United States Marine hospital, San Francisco-----	1
Autogenous-vaccine preparation, United States Marine hospital, San Francisco-----	6
Tissue for histological examination:	
United States Marine hospital, San Francisco-----	61
United States Indian Service, Valentine, Ariz-----	1
<hr/>	
Rodent examination:	
City rats-----	2, 017
Fumigated rats-----	1, 749
Ship rats (trapped)-----	47
Oakland rats-----	38
Squirrels (10,064)-----	9, 772
<hr/>	
Total-----	13, 623
<hr/>	
Bacteriological examination of water:	
Southern Pacific Railroad Co-----	90
Santa Fe Railroad Co-----	54
Northern Electric Railroad Co-----	22
Yosemite Valley Railroad Co-----	7
Western Pacific Railroad Co-----	11
Central California Traction Co-----	4
Nevada County Narrow Gauge Railroad Co-----	2
Tonopah & Tidewater Railroad Co-----	2
California Southern Railroad Co-----	3
Modesto & Empire Traction Co-----	2
Northwestern Pacific Railroad Co-----	14
San Diego & Arizona Railroad Co-----	2
Amador Central Railroad Co-----	2
McCloud River Railroad Co-----	4
Sierra Railroad Co-----	7
San Joaquin & Eastern Railroad Co-----	7
Nevada Copper Belt Railroad Co-----	4
Nevada Central Railroad Co-----	3
San Pedro, Salt Lake & Los Angeles Railroad Co-----	4
Pacific Coast Railroad Co-----	6
Pajaro Valley Railroad Co-----	3
Camino, Placerville & Lake Tahoe Railroad Co-----	2
Pacific Coast Steamship Co-----	3
Matson Navigation Co-----	1

## Bacteriological examination of water—Continued.

Marysville Water Co.....	7
United States Army, Fort McDowell.....	7
United States immigration station, Angel Island.....	5
Mr. S. H. Smith, Jamestown, Cal.....	1

Total .....	279
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*Examinations of water supplies on interstate carriers.*

Number of sources of water supplies in the district of the Pacific.....	139
Number of samples of water examined.....	266
Number of samples of water conforming to Treasury Department standard .....	198
Number of samples of water not conforming.....	68
Number of sources of supply certified.....	107
Number of sources of supply certified after improvements were installed.....	1
Number of sources of supply condemned.....	2
Number of sources of supply discontinued during the year.....	7
Miscellaneous examinations of water supplies.....	13

## PLAGUE SUPPRESSIVE MEASURES IN NEW ORLEANS, LA.

The fiscal year ending June 30, 1918, marked the completion of four years of plague suppressive measures in New Orleans, and the virtual close of the campaign.

In a general way it may be said that a plague eradication campaign has been accomplished when (a) all human plague cases have been eliminated; (b) all rodent plague apparently eliminated as indicated, by inability to capture any infected rodent; (c) rodent population reduced numerically so that complete disappearance is practically assured; and (d) rat harbors destroyed and the majority of premises so reconstructed as to lessen chances of their again becoming infected.

During the fiscal year just closed, health conditions in New Orleans have been steadily improving, and it would appear that all danger from the epidemics of 1914 are at an end, as may be inferred from the following: (a) Majority of premises in the infected areas have been rat proofed; (b) the rodent population has been markedly reduced; (c) no human plague since September 8, 1915; (d) last plague-infected rat captured April 3, 1917 (a period of 15 months); and (e) almost an entire absence of rats showing lesions suspicious of plague. To date only a very few showing lesions captured.

The situation appears so favorable that on April 20, 1918, the city of New Orleans was declared a clean port, and practically all quarantine restrictions have been removed.

Notwithstanding the favorable appearance of the situation, it was not considered the wisest course to cease all service operations, but to retain a sufficient force to keep the situation in hand. During the past year, rodent plague has apparently been increasing in many ports of the world, and if possible every precaution must be taken to prevent its reintroduction at this port.

## ORGANIZATION AND PERSONNEL.

On May 1, 1918, personnel at this station was reduced to 28, exclusive of officers, this number being considered sufficient for the following: (a) Fumigation of such vessels as may be remanded from

quarantine, and such others as may deem attention; (b) trapping operations along wharves and on ships; (c) prosecution of cases pending in city courts for infraction of the rat-proofing ordinances; and (d) such clerical work as is incident to the foregoing procedures.

The only striking occurrence during the past year is the gradual reduction in the force, and the ultimate declaration of New Orleans as a clean port.

#### RODENT CONTROL.

The reconstruction of premises for elimination and preventing rat harborages has continued through the year, as in previous years, the number becoming smaller, due chiefly to the fact that the majority of premises have been rat proofed, or the owners are financially unable to do the work.

Approximately 80 per cent of the premises have met with the necessary attention. About 15 per cent are partially complete or have had all menace removed, and the remainder are totally non-compliant.

Practically nothing has been done toward rat proofing of existing wharves, and conditions along the river front remain almost as they did one year ago. At present, they remain a serious menace to re-introduction of rodent plague. Should an outbreak occur, it is unlikely to gain much headway, due to the fact that previous existing conditions have been overcome.

*Rat trapping.*—During the past year trapping operations have been continued with a diminished force, since the number of infected animals captured was constantly decreasing. After May 1, 1918, the trapping force operating in the city was discontinued, but trapping operations were continued on the wharves, and on shipboard.

Since the waterfront offers the easiest point of entrance of the disease, it should be kept under close observation for some time. A comparison of trapping operations of this year with previous years is not practicable owing to the reduction of the personnel engaged.

The following is a summary of rodents trapped during the fiscal year 1918:

<i>Mus norvegicus</i> .....	19,003	
<i>Mus rattus</i> .....	9,315	
<i>Mus alexandrianus</i> .....	7,998	
		36,316
<i>Mus musculus</i> .....	129,040	
Wood rats .....	5,922	
Unclassified .....	7,332	
Musk rats .....	25	
		142,319
Total .....		178,635

#### OUTGOING QUARANTINE.

Prior to May 1, 1918, all vessels entering the port of New Orleans were required to fumigate once in four months, to rat guard, and to breast off from the wharf, in lieu of which a foul bill of health was issued.

Since May 1, 1918, there have been few restrictions placed on shipping. Vessels are still being fumigated, but the number is rapidly decreasing, and failure to fumigate does not interfere with receipt of a clean bill of health, except under unusual conditions. The city ordinance requiring rat guarding, and fending-off is still in force, but is not enforced because of reduced personnel.

The following gives in detail the routine quarantine operations during the past year:

Number of ships clearing	1,866
Number of clean bills of health issued	1,601
Number of foul bills of health issued	265
Number of ships fumigated with cyanide gas	596
Number of ships fumigated with sulphur	41
Total number of ships fumigated	637
Pounds of cyanide used	35,832
Pints of sulphuric acid used	54,198
Pounds of sulphur used	1,286

## LABORATORY.

As in previous years no efforts have been spared in the laboratory to detect any indication of plague infection. The work accomplished has lessened during the year in accordance with the gradual cessation of the campaign. The laboratory practice is to give first place to a microscopic diagnosis supplemented by a biological and microscopic examination in all suspected cases. During the year a total of 178,635 rodents have been received, 48,143 of which have been examined and none have been found infected. During the entire campaign there have been received 1,322,936 rodents, of which 490,129 have been examined, and of these 353 have been found infected.

The following tables give detailed information regarding laboratory operations during the year:

Number of animals examined during the year ending June 30, 1918	48,143
Number of animals examined during the year ending June 30, 1918, by sex and species, as follows:	

*Mus norvegicus*—

Male	6,673
Female	12,330

*Mus rattus*—

Male	3,963
Female	5,352

*Mus alexandrinus*—

Male	3,311
Female	4,687

*Mus musculus*—

	5,743
--	-------

Wood rats (*Neotoma floridana* rub.)

Male	245
Female	266

Wood rats (*Sigmodon nispidus*)—

Male	2,203
Female	1,620

Wood rats (*Hesperomys palustris*)—

Male	686
Female	479

Muskrats (*Fiber zibethicus*)—

Male	18
Female	7

Number of animals examined during the year ending June 30, 1918, by sex and species—Continued.

*Proechimys centralis*—

Male	194
Female	229

Rodents examined..... 48,006

Opossums (*Murine*)—

Male	62
Female	74

Ferrets..... 1

Total miscellaneous animals examined..... 137

Total animals examined..... 48,143

Animals not examined..... 130,492

Total animals received at the laboratory..... 178,635

Recapitulation of rat-proofing operations at New Orleans for the fiscal year ending June 30, 1918:

Buildings—

Completed, rat proofed	17,624
Incomplete, work begun	20,362
Noncompliant, no work done	4,702
Originally rat proofed	136,385
Demolished	4,712

Total number..... 183,785

Work performed—

Square yards concrete laid	218,574
Linear feet chain wall installed	383,954
Linear feet flashing laid	257,135
Square yards tar-cinder floor laid	2,805
Linear yards wall fill constructed	35,762

Total cost of rat proofing, \$1,048,371.

Legal cases—

Acquitted or withdrawn at request of Service	1,490
Convicted	190
Appealed	58
Pending June 30, 1918	1,563

Total cases..... 3,301

Fines imposed..... 990

Number of animals received during the year ending June 30, 1918..... 178,635

Number of animals received during the year ending June 30, 1918, by species:

<i>Mus norvegicus</i>	19,003
<i>Mus rattus</i>	9,315
<i>Mus alexandrinus</i>	7,998
<i>Mus musculus</i>	129,040
Wood rats ( <i>Neotoma floridana</i> rub.)	511
Wood rats ( <i>Sigmodon nispidus</i> )	3,823
Wood rats ( <i>Hesperomys palustris</i> )	1,165
Musk rats	25
<i>Proechimys centralis</i>	423
Putrid rodents	7,195

Total rodents received..... 178,498

Opossums (*Murine*)..... 136

Ferrets..... 1

Total miscellaneous animals received..... 137

Grand total..... 178,635



*Record of plague-infected rats examined.*

Species.	Total.	Species of fleas found.								Total.
		L. cheop-sis.	Per cent.	C. mus-culi.	Per cent.	C. fas-ciatus.	Per cent.	C. canis.	Per cent.	
Mus norvegicus.....	716	1,532	2.14	212	0.30	16	0.02	44	0.06	1,804
Mus rattus.....	32	18	.56	12	.37	0	.....	5	.16	35
Mus alexandrinus.....	38	64	1.68	45	1.18	0	.....	1	.03	110
Wood rats.....	5	0	.....	0	.....	0	.....	0	.....	0
Total.....	791	1,614	2.04	269	.34	16	.02	50	.06	1,949

*Flea infestation of rats.*

[Average number of fleas per rat.]

Week ending—	Mus norvegicus.		Mus Ratus and Alexandrinus.	
	L. cheopis.	C. fasciatus.	L. cheopis.	C. fasciatus.
1917.				
July 7.....	3.882	.....	0.5	.....
July 14.....	4.965	.....	.....	.....
July 21.....	2.48	.....	.5	.....
July 28.....	3.412	.....	.....	.....
Aug. 4.....	7.87	.....	1.000	.....
Aug. 11.....	2.111	.....	2.000	.....
Aug. 18.....	3.904	.....	1.000	.....
Aug. 25.....	4.370	0.111	.....	.....
Sept. 1.....	9.263	.105	.....	.....
Sept. 8.....	2.765	.....	.....	.....
Sept. 15.....	2.171	.....	.....	.....
Sept. 22.....	.783	.....	1.5	.....
Sept. 29.....	.225	.....	5.333	.....
Oct. 6.....	1.8571	.1190	1.000	.....
Oct. 13.....	1.638	.....	1.666	.....
Oct. 20.....	.478	.1304	.....	.....
Oct. 27.....	.5	.....	.....	.....
Nov. 3.....	.1666	.....	.....	.....
Nov. 10.....	.154	.....	2.000	.....
Nov. 17.....	.04761	.....	2.000	.....
Nov. 24.....	.964	.035	.....	.....
Dec. 1.....	.358	.....	.....	.....
Dec. 8.....	.5454	.....	5.000	.....
Dec. 15.....	.22222	.....	.....	.....
Dec. 22.....	1.125	.....	.....	.....
Dec. 29.....	.0869	.....	.....	.....
1918.				
Jan. 5.....	.....	.....	.....	.....
Jan 12.....	1.125	.....	.....	.....
Jan 19.....	.7058	.....	2.000	.....
Jan. 26.....	.....	.....	.....	.....
Feb. 2.....	.....	.....	.....	.....
Feb. 9.....	.70	.....	.....	.....
Feb. 16.....	.238	.....	.....	.....
Feb. 23.....	.....	.....	.....	.....
Mar. 2.....	.2000	.....	.....	.....
Mar. 16.....	1.375	5.6000	3.000	.....
Mar. 23.....	.....	.....	.....	.....
Mar. 30.....	.....	.125	.75	.....

NOTE.—Owing to the abatement of plague indications on such rodents as were captured, the examination was not conducted during the entire fiscal year.

*Other activities of the laboratory.*

Water:	
Vessels from which supplies were obtained.....	285
Total number of samples collected.....	381
Number of samples confirmed.....	270
Number of samples not confirmed.....	111
Number of samples badly polluted.....	59
Probability of contamination in handling.....	32
Number of samples untreated.....	244
Number of samples treated.....	55
Filtered .....	53
Distilled .....	1
Other methods .....	1
Blood:	
Wassermanns performed .....	364
Cultures .....	5
Spinal fluid:	
Examination for meningococcus.....	1
Sputum:	
Examination for tubercle bacillus.....	2
Urine:	
Examinations made .....	5
Vaccine:	
Number of vaccines prepared.....	2

## PLAGUE-SUPPRESSIVE MEASURES AT SEATTLE, WASH.

During the fiscal year ending June 30, 1918, all plague-suppressive and plague-preventive measures on Puget Sound were conducted, as in former years, under the supervision of the Public Health Service, Surg. B. J. Lloyd in charge.

*Present operations.*—The work of the year has been principally confined to educating the public in the importance of the suppressive measures carried on under the supervision of the Public Health officials and in enforcing the city regulations regarding rat-proofing of buildings, examination of rodents and of suspicious cases. The work has been vigorously prosecuted during the year with the following objectives in view:

(a) The prevention of the introduction of plague from other ports (continued from previous plan).

(b) Trapping and poisoning operations, including the picking up of dead rats (continuation).

(c) Laboratory examination of rodents and suspicious cases (continuation).

(d) Educational work, by means of lectures, illustrated and otherwise, and by mailing circular letters to persons who make complaints about rats.

(e) Intensive trapping on the part of residents in given districts (rat-drive campaign).

(f) Trapping operations in cities outside of Seattle.

(g) The extermination of existing foci in Seattle (continued from previous plans, but reinforced).

(h) The rat-proofing of buildings in cities outside of Seattle.

(i) The rat-proofing of buildings in Seattle.

(j) The maintaining of the full cooperation of State and local authorities.

Some of the measures deserve more than mere mention. When an infected rat is found strenuous measures are employed to eradi-

cate the focus. The rat-proofing ordinances laid out jointly by the city health department and the Public Health Service are meeting with less opposition on the part of the property owners upon whom often falls considerable expense. The measures employed involve the razing of frame structures, replacing wooden floors with concrete, the use of metal lath wherever practicable, and reinforcing double floors with wire netting.

The service supervises rat-proofing of all new buildings and of those structures undergoing repairs. When a building or repair permit is filed a copy of the rat-proofing ordinance is mailed to the owner (or agent) and the contractor. The city building inspectors cooperate with the service in securing compliance with these ordinances. Restaurant permits are referred to headquarters. These places are visited to determine whether or not they comply with ordinances, regardless of whether that particular ordinance applies.

*Summary of plague suppressive measures at Seattle, Wash.*

New buildings inspected.....	675
New buildings reinspected.....	1, 083
Basements concreted, new buildings (429,083 square feet).....	562
Floors concreted, new buildings (485,643 square feet).....	209
Yards, etc., concreted, new buildings (124,160 square feet).....	139
Sidewalks concreted.....square feet.....	338, 990
Total concrete laid, new structures.....do.....	1, 378, 886
New buildings elevated.....	92
New premises rat-proofed, concrete.....	771
Old buildings inspected.....	108
Premises rat-proofed, concrete, old buildings.....	104
Floors concreted, old buildings (168,760 square feet).....	104
Premises otherwise rat-proofed, old buildings.....	4
Openings screened, old buildings.....	18
Rat holes cemented, old buildings.....	44
Wooden floors removed, old buildings.....	105
Wire screening used.....square feet.....	2, 995
Buildings razed.....	93

WATER FRONT.

Inspection and reinspection of vessels and histories recorded.....	623
Vessels fumigated.....	219
Sulphur used.....pounds.....	247, 600
New rat guards installed.....	487
Defective rat guards repaired.....	907
Fumigation certificates issued.....	219
Canal certificates issued.....	23
Port sanitary statements issued.....	2, 294

LABORATORY OPERATIONS.

Dead rodents received.....	248
Rodents trapped and killed.....	13, 814
Rodents recovered after fumigation.....	1, 568
Total.....	15, 630
Rodents examined for plague infection.....	11, 085
Rodents proven plague infected.....	0
Blocks poisoned.....	16
Poison distributed.....pounds.....	914
Bodies examined for plague infection.....	5
Bodies found plague infected.....	0

## CLASSIFICATION OF RODENTS.

<i>Mus rattus</i> .....	1,334
<i>Mus alexandrinus</i> .....	3,922
<i>Mus norvegicus</i> .....	7,879
<i>Mus musculus</i> .....	2,495

(NOTE.—4,256 female rats trapped; 1,314 pregnant.)

## MISCELLANEOUS WORK.

Rat-proofing notices sent to contractors.....	680
Letters sent in answer to rat complaints.....	118

*Plague preventive measures in Tacoma, Wash., Nov. 10, 1917, to Feb. 25, 1918.*

Rodents found dead.....	26
Rodents trapped and killed.....	2,026
Rodents examined for plague infection.....	1,797
Rodents proven plague infected.....	0

## CLASSIFICATION OF RODENTS.

<i>Mus rattus</i> .....	179
<i>Mus alexandrinus</i> .....	316
<i>Mus norvegicus</i> .....	1,451
<i>Mus musculus</i> .....	106
Total.....	2,052

## WATER SUPPLIES IN INTERSTATE COMMERCE.

The certification of the satisfactory standard of purity of water supplied for the drinking and culinary use of concerns engaged in interstate commerce, has been continued throughout the year under the supervision of the service in cooperation with the various health authorities having immediate jurisdiction over such supplies. Since a sanitary survey of the supply has been required in addition to a bacteriological examination, of all such waters, there has been a steadily decreasing number of such water supplies continuing in use, largely due to the elimination of many indiscriminate supplies. This is but one of the desirable results following the adoption of the survey.

In addition to being prerequisite to proper control of water supplies furnished to interstate commerce, the plan of cooperation followed serves to greatly encourage the health authorities having immediate jurisdiction of the water supply, to exercise more definite and direct supervision of these supplies in their respective districts; particularly is this observed in those States in which there is as yet no organized division of water-supply control. Consequently, while there has been secured an improvement in the purity of water supplied interstate commerce, there has been at the same time a coincident improvement in the water supply of the various local communities which in turn serve as an incentive to effect the improvement of other contiguous local supplies not necessarily entering into interstate use.

During the year, studies have been in progress looking toward simplification and standardization of the water control exercised by the various local health authorities. These studies have not as yet reached a conclusion and will be continued into the following year. The universal press of new health work incident to the conditions

imposed by reason of war and the consequent demand upon available man power have had a decided influence in temporarily retarding further development and perfection of cooperative water control, while at the same time accentuating the great need of such control.

There were a total number of 3,309 sources from which water was supplied during the year for the drinking and culinary use of concerns engaging in interstate commerce. Of this number, 1,893, or 57.2 per cent, were certified to be of the required standard of purity, while 179, or 5.4 per cent, failed to meet the required standard of purity. The remainder of 1,245, or 37.6 per cent, were not certified as to their purity during the 12-month period. The comparatively large percentage of supplies in use in which certification was delinquent reflects the conditions obtaining, incident to the prosecution of the war. However, all in all, the results obtained and reported, indicate a more satisfactory control during the year than that obtained heretofore. There were a total of 9.4 per cent of the supplies examined, certified as not meeting the prescribed standard of purity, in direct comparison with 5.7 per cent in the preceding year. In every case where the supply was reported as failing to meet the standard of purity, the use of such water in interstate commerce was immediately ordered discontinued, pending its satisfactory improvement or abandonment. In addition, the supply was placarded as unfit to drink, in order to insure the protection of all possible users of such a supply.

The following table shows the total number of supplies reported in use in interstate commerce in each State, together with the number of supplies certified as having been found to meet the standard of purity, and the number which failed to meet the standard:

*Statistics concerning the certification of water provided on cars and vessels by interstate carriers for the fiscal year ending June 30, 1918.*

State.	Number of water supplies in use.	Number certified within 12 months.	Per cent certified within 12 months.	Number of supplies found polluted.
Alabama.....	43	32	74.4	1
Alaska.....	19	9	47.3	0
Arizona.....	57	22	38.5	0
Arkansas.....	65	27	41.5	1
California.....	108	87	80.5	3
Colorado.....	51	20	40.0	7
Connecticut.....	22	6	27.4	0
Delaware.....	6	6	100.0	0
District of Columbia.....	1	1	100.0	0
Florida.....	80	41	51.2	0
Georgia.....	82	43	52.4	2
Hawaii.....	3	1	33.3	0
Idaho.....	42	25	59.5	2
Illinois.....	84	35	41.6	6
Indiana.....	98	50	50.1	13
Iowa.....	66	22	33.3	1
Kansas.....	109	83	76.1	13
Kentucky.....	57	30	52.6	4
Louisiana.....	105	40	38.0	0
Maine.....	101	92	91.0	1
Maryland.....	29	20	68.0	4
Massachusetts.....	48	36	75.0	0
Michigan.....	143	75	52.4	14
Minnesota.....	89	56	62.9	9
Mississippi.....	47	23	48.9	1
Missouri.....	84	49	58.3	3
Montana.....	37	26	70.2	3
Nebraska.....	56	49	87.5	3
Nevada.....	21	16	76.1	0

*Statistics concerning the certification of water provided on cars and vessels by interstate carriers for the fiscal year ending June 30, 1918—Continued.*

State.	Number of water supplies in use.	Number certified within 12 months.	Per cent certified within 12 months.	Number of supplies found polluted.
New Hampshire.....	31	27	87.0	0
New Jersey.....	42	42	100.0	4
New Mexico.....	21	6	28.5	0
New York.....	166	82	49.3	5
North Carolina.....	62	32	51.6	2
North Dakota.....	36	20	55.5	5
Ohio.....	151	123	81.4	31
Oklahoma.....	57	32	56.1	6
Oregon.....	65	22	33.8	2
Pennsylvania.....	216	97	44.9	2
Rhode Island.....	5	4	80.0	0
South Carolina.....	42	15	35.7	0
South Dakota.....	29	11	37.9	0
Tennessee.....	44	24	54.5	2
Texas.....	214	117	54.6	4
Utah.....	19	17	89.4	3
Vermont.....	22	17	77.2	0
Virginia.....	83	47	56.6	4
Washington.....	76	55	72.3	2
West Virginia.....	63	40	63.4	8
Wisconsin.....	81	22	27.1	6
Wyoming.....	20	12	60.0	2
Foreign.....	11	7	63.6	0
Total and average.....	3,309	1,893	57.27	179

During the year there were a total of 3 States in which all the supplies known to be in use in interstate commerce were certified. There were a total of 5 States in which 90 per cent of the supplies were certified within 12 months, and 15 States in which 75 per cent were certified. Fifty per cent of the supplies known to be used in interstate commerce were certified in 35 States. The highest percentage of supplies found as failing to meet the required standard of purity, of the total number examined in any one State, was 35 per cent.

While it is obvious that there is considerable room for improvement in the control of interstate water supplies, nevertheless, taking the prevailing conditions into consideration, it must be stated that there has been quite fair progress made in the right direction during the year. On every hand there has been unrestricted cooperation so far as possible.

Inasmuch as a major percentage of water supplies are interstate, both as regards points of origin and also distribution due to interstate commerce, it makes it seemly that the control of water supplies should be standardized for all States alike and all interstate commercial enterprises alike. To this end it has been the endeavor during the year past to secure universal and active cooperation of the State authorities, all working together with central Federal supervision; although the work has been necessarily handicapped due to lack of both personnel and funds for the purpose in Federal and State divisions, still some progress is evident and promises more.

#### OPERATIONS OF THE SANITARY DISTRICT OF THE GREAT LAKES.

During the fiscal year July 1, 1917, to July 1, 1918, the activities of the sanitary district of the Great Lakes have been more varied

than ever before. The laboratory cars "Wyman" and "Hamilton," which were used to some extent in the fiscal year 1917, have been of more service to this district and to the Public Health Service in extra-cantonment work throughout the United States. The major part of the work has centered about these cars, especially in controlling epidemics of cerebrospinal meningitis in various extra-cantonment zones.

At the close of the last fiscal year the laboratory car "Wyman" was stationed at the Great Lakes Naval Training Station for the purpose of examining throat cultures of suspected carriers of cerebrospinal meningitis. This work was continued in the laboratory of the car until the latter part of July, at which time the car was ordered to different extra-cantonment zones for the purpose of making sanitary surveys. However, the work of examining throat cultures of suspected carriers was continued by Asst. Surg. G. C. Lake at the laboratory of the sanitary district.

The car "Wyman," in charge of Surg. J. O. Cobb, left Chicago on July 23, 1917, for the purpose of making sanitary surveys in certain extra-cantonment areas at certain camps within the Great Lakes Sanitary District. A sanitary survey of the area surrounding Camp Grant, at Rockford, Ill., was made. From here the car proceeded to Sparta, Wis., where an intensive sanitary survey was made of Sparta and of the area surrounding the United States military reserve, which included Camps McCoy and Robbins. On July 28 the car was moved to Minneapolis, Minn., and a sanitary survey of the extra-cantonment area of Fort Snelling was made, including an inspection trip to St. Paul, Minn. The latter part of July the car was ordered to Battle Creek, Mich., where a sanitary survey was made of the city and of the extra-cantonment area surrounding Camp Custer.

Early in December the car "Hamilton" in charge of Asst. Surg. C. V. Akin was ordered to Manhattan, Kans., thence to Junction City, Kans., for the purpose of investigating an outbreak of cerebrospinal meningitis in the extra-cantonment area surrounding Camp Funston. The car was directed to proceed to McLouth, Kans., in January for the purpose of examining throat cultures in connection with a serious outbreak of cerebrospinal meningitis. Early in February the car was ordered to proceed to Columbia, S. C., at which point work of similar nature was begun. Further investigation of the outbreak of cerebrospinal meningitis at Dillon, S. C., and several other towns in the vicinity of Columbia was made. On March 20, the car "Hamilton" left for Greenville, and was employed in general laboratory work during the absence of a Red Cross bacteriologist. Besides providing the means for investigating cerebrospinal meningitis outbreaks and doing the necessary laboratory work in connection with sanitary surveys both cars have proved their versatility as portable laboratories.

On August 19, 1917, the car "Wyman" was ordered to proceed to Leavenworth, Kans., at which point the laboratory was utilized for general laboratory work, including analyses of water and milk supplies. In December the "Wyman" was directed to proceed to Alexandria, La., where it was used for general laboratory work in the extra-cantonment area surrounding Camp Beauregard. At this

point particular attention was directed to investigating an outbreak of cerebrospinal meningitis. The "Wyman" remained at this point until May, 1918.

The "Hamilton" was directed to proceed to Florence, Ala., early in April. At this point the car was put in a position to take charge of such laboratory work as might be necessary in connection with the sanitation of the Muscle Shoals Sanitary District. In addition to general laboratory work, samples of the water supplies of Florence, Sheffield, and Tusculumbia, Ala., together with some private supplies were examined. The personnel rendered assistance in the establishment of the permanent laboratory at Florence, and the car was directed to return to Chicago.

Besides carrying on the work at extra-cantonment zones assistance was also rendered the towns within the sanitary district of the Great Lakes which were experiencing epidemics of typhoid fever. A resurvey of the water supply at Leavenworth, Kans., was made. This supply had previously been condemned by an officer of the service. It was found that although the supply had been improved to some extent it did not conform to the standard and certificates were withheld pending certain changes. An epidemic of typhoid fever at South Bend, Ind., was investigated in September. A complete survey of the municipal water supply was made, the cause of the pollution of the supply discovered, and regulations made for eliminating it. Elimination of the contaminated influence consisted in installing a chlorination apparatus and on another inspection in October the apparatus was found to be working satisfactorily. In December certificates were issued to the railroads permitting the use of the water supply on coaches.

In October the "Hamilton" left Chicago for an inspection of water supplies that had previously been contaminated, particularly the supply of Sault St. Marie, Mich. It was found that the supply at this city was contaminated by vessels, particularly in the spring of the year, when they "lie to" in harbor, which undoubtedly was the cause of prevalence of typhoid fever. On the recommendation of Surg. Cobb, a chlorination apparatus for the treatment of city water supplies that had previously been contaminated at certain ports in Michigan and Illinois, and certificates were issued for seven railroad supplies. During November Asst. Surg. C. V. Akin made resurveys of railroad water supplies at Alton, Ill.; Richmond, Ind.; Grand Haven, Cadillac, Petoskey, and Traverse City, Mich. A survey of the municipal water supply of Milwaukee, Wis., was also made.

Pursuant to department circular No. 72, relative to drinking-water supply of vessels in interstate traffic on the Great Lakes, the laboratory cars have aided materially in enforcing these regulations. It was possible to station a car at a port while surveys of the boats were made and samples of the drinking water collected and analyzed. In this manner the analytical work obtained was always easily comparable. An inspection was made of water-purification apparatus on several large lake boats plying from Sault Ste. Marie to Detroit, Buffalo, and other lake ports. It was found that boat companies were endeavoring to comply with the regulations relative to the drinking-water supply, and that men in charge of this apparatus on the boats were competent. Inspection must be continued for the



purpose of detecting improper operation of water-treatment apparatus, and in some cases companies must be forced to comply with the regulations. In order to more closely coordinate the work of the district with that of the local and State boards of health, conferences have been held at various times.

The laboratory car "Hamilton" and personnel was ordered to proceed to Yellowstone National Park, Wyo., late in May, where the month of June was spent in making a sanitary survey of the water supplied to tourists.

#### REPORT OF SANITARY SURVEY OF THE WATER SUPPLY OF YELLOWSTONE NATIONAL PARK.

The Yellowstone National Park is situated in northwestern Wyoming, with an extension of about 2 miles into Montana on the north and the same distance into Montana and Idaho on the west. It has a total area of about 3,348 square miles. The open season is approximately three months, and during this time in 1917 a total of 35,400 persons visited the park, the average length of stay being three or four days. In addition to the tourist travel there is a fixed population of about 1,500 persons in a normal season.

For convenience the tourists may be classified, according to the method used in seeing the park, as follows:

First. The tourist secures his meals and lodgings at one of the hotels located at the principal points of interest and is transported from one place to the other by the Yellowstone Park Transportation Co.

Second. The tourist secures his meals and lodgings at one of the camps maintained by the Yellowstone Park Camping Co., and is transported from one place to another by the Yellowstone Park Transportation Co.

In the third case, individuals wishing to go through the park provide their own means of conveyance and carry with them their camping and cooking facilities, together with their subsistence. A few of this class secure part of their meals and lodgings at the hotels or camps.

During the season of 1917 about 25 per cent of the tourists stayed at the hotels and 15 per cent had permanent camps; the remaining 60 per cent used private automobiles. It is estimated that approximately one-fifth of this latter class stopped at hotels or camps part of the time. The remainder used their camp equipage during the entire trip.

The season at the close of the fiscal year is abnormal for the reasons that the hotels are not open, and the camping company must provide facilities for caring for the first two classes of tourists. In addition the greater number of tourists are traveling in their own automobiles due to the higher rates and inability to secure accommodations on the railroads.

#### SEWAGE DISPOSAL IN REFERENCE TO THE WATER SUPPLY.

When a stream is used to carry away sewage the water supplied along the lower course is more or less contaminated, being entirely due to the extent to which self-purification has advanced. The sewage at Mammoth Hot Springs reaches the Gardiner River through

two different sources. One is a tile sewer which ends on the dump pile and from there runs on the surface to the river. The sewage from the Mammoth Hotel empties into an extinct geyser hole located in the rear of the hotel. In June, 1914, Chemist R. B. Dole, United States Geological Survey, showed that this geyser hole empties into the Boiling River, through an underground stream, and from there is carried into the Gardiner River. He concluded that the temperature of this river was not sufficiently high to sterilize the sewage, and that the hotel furnished an important source of pollution of the Gardiner River.

A water sample taken above Mammoth showed a total count of 111 per 1 cubic centimeter and 6 colons per 100 cubic centimeter, while one taken a few minutes later below Mammoth showed a total count of 140 per 1 cubic centimeter and 100 colon per 100 cubic centimeter. The camping company at the Mammoth Camp maintained outhouses, but it is not thought that they impaired the quality of the water supplied by Gardiner, Mont. At the Upper Geyser Basin the sewage from Old Faithful Inn is carried by means of a tile drain in an open ditch into Firehole River. The camp company at Geyser Camp provides outhouses which are not thought to impair the water supply at the Lake Hotel, a tile line carrying the sewage out into Yellowstone Lake. The camping company at Lake Camp has outhouses. At the Canyon Hotel the sewage is discharged indirectly into Yellowstone River. In no case is the sewage from the hotels treated in any manner before it is allowed to empty into open streams or the lake.

#### SOURCES AND QUALITY OF THE WATER SUPPLY.

*Water supplied to tourists at the two main entrances.*—Approximately 38 per cent of the tourists entering the park come in by way of Gardiner, and while this is not a regular stopping point, still there are two hotels and two or three ice-cream parlors and other places where tourists frequent, and where they drink the Gardiner supply. This supply is secured from the Yellowstone River through an iron pipe which lies in the bed of the river below the mouth of the Gardiner River. The well into which this pipe empties is constructed of reinforced concrete and has its top at 2 or 3 feet above the former high-water mark of the Yellowstone River. At the time of the survey the river rose to such a height that the well was submerged, thus bringing in Gardiner River water which carried the sewage from Mammoth Hot Springs, which is located 5 miles upstream, thus grossly contaminating the water supply. For cleaning purposes the well is connected by sluice to the Yellowstone River. At times of normal river level contamination might take place from the sluice. The inlet for the Gardiner supply was carried above the Gardiner River, subsequent to a serious outbreak of typhoid fever in Gardiner in 1912.

The present practice of Gardiner was to pump river water from the Yellowstone into a 30,000-gallon elevated storage tank, the town being supplied by gravity pressure from here. This tank was cleaned out two or three times a year with a strong solution of hypochlorite of lime. Recently no attempt has been made to treat the water in any way. A repetition of this abnormally high water might occur any season and would be sure to highly pollute the

water supply with Gardiner River water, unless conditions are immediately changed at the pump house. Notices were posted ordering the water boiled before using it for drinking or culinary purposes. The town is supplied by the Gardiner Electric Light & Water Co. The service officer in charge of the survey met some of the directors of the company and the leading business men and explained the condition of the water supply. It was advised that a consulting engineer be employed and that they secure information as to types of filters and purifying devices best suited to their needs.

The city of Yellowstone is located on the Oregon Short Line, and approximately 42 per cent of the tourists enter the park at this point. The railroad company maintains a dining room, which accommodates as high as 400 tourists a day. There are also two hotels, each of which accommodates as high as 75 tourists a day for meals.

The water supply of the railroad comes from a large elevated reservoir, which they fill from wells. Microscopical examinations of several samples of this supply fail to show contamination. Examinations were made of the supplies of the hotels, which come from wells, and no apparent source of contamination was discovered, except in the case of a 40-foot dug well. Within a radius of 50 feet from this well are three toilets. The soil is of such character as to furnish an efficient filter, but it is believed that this natural filter might become overtaxed or a small underground stream might develop which would contaminate the source rapidly. None of the wells is properly protected against surface drainage.

*Water supplied by the hotels.*—The Mammoth Hotel supply comes from a reservoir located at the foot of Mammoth Hot Springs; this supply is used at Mammoth Camp, the fort, and by the Department of the Interior. The reservoir is fed by an iron pipe, which receives its supply from Glenn Creek at a point below the Golden Gate. Glenn Creek carries the combined flow from three sources:

- (1) Glenn Creek proper.
- (2) Glenn Creek Sluice, which drains a more or less swampy area lying along the main road south of Golden Gate.
- (3) A pipe line, which collects at its inlet Panther Creek water.

These supplies were tested in the laboratory, the last two supplies showing unsatisfactory tests. It is believed that the drainage area furnishing the supply for Mammoth Hot Springs is guarded sufficiently to prevent pollution by campers. However, pollution might occur from animals, working parties, and drainage from highroads.

The supply for Old Faithful Inn comes from a mountain side southeast of the inn and is collected in an old covered box, from which an iron pipe leads to an open reservoir approximately 100 by 60 feet, built with sloping sides and having a depth at the center of about 8 feet. No precaution has been taken by a fence or by any sort of cover to protect this reservoir. At the time of the survey the season was not advanced and the Inn and Hamilton's store were using water directly from the collection box at the springs, the reservoir being choked with growth and sediment and not being used. Examination of water samples taken at the collecting box and at the tap at Hamilton's store show no apparent contamination. This supply is thought to be comparatively safe.

The water supply for the Lake Hotel comes from a spring located northwest of the hotel on the side of Elephant Back Mountain. The

water is collected in a wooden box and flows through an iron-pipe line to the hotel. Samples taken at the collecting box and at the source and at points of usage show the water to be excellent for drinking purposes. The only possible source for contamination would be at the collecting box, where either animal or man might pollute the supply.

The Canyon Hotel supply comes from springs located north of the hotel and is carried in an iron pipe into a well located below the floor of the engine room in the hotel. There is no provision made for keeping wash water from flowing into this well. This supply was tested at the outlet of the pipe as it flows into the basement well and was found to be entirely satisfactory.

*Water supplied by the camping company.*—The supply here comes from the reservoir used by all persons at Mammoth Hot Springs and is carried down to the camp from the reservoir in an iron pipe, taps being located on this line in the camp proper and the kitchen. The pipes are not located near outhouses, and there is no apparent reason why the supply should not reach the taps in as pure condition as it left the reservoir.

The supply for this camp was pumped from a creek just south of the Firehole River and at a point just above where it empties into the river. This creek drains an old woodcutters' camp, and the drainage area contained various refuse, including a large manure heap. Samples of this supply show the water to have a high colon count and the supply was condemned at the time of the survey and arrangements made for the camping company to get their drinking water from the Old Faithful Inn supply. The drainage area of the supply which had been used in former years by the Geyser Camp showed evidence of having been frequented by animals, both wild and domestic, and samples taken of this water show it to have a colon count which would prohibit its being used for drinking purposes.

This camp is not to be run this season as a main camp, but a keeper is stationed there and provision will be made for accommodating a small number of persons in case of a breakdown or inability on their part to proceed to the Canyon Camp. The supply here was being taken from a small creek which drains an area frequented to a large extent by bears and some other wild animals. A field survey shows the supply is not safe for drinking purposes.

This camp has been using water from the Yellowstone River, pumping it to the camp by a hydraulic ram. The unusually high water this season has compelled the use of water of a spring situated on the camp grounds. This supply was condemned, since it was subject to contamination by surface drainage and was located at a point below at least one outhouse. At the point on the Yellowstone River where the supply was taken tests showed 10 colon per 100 cubic centimeters. It is thought that man furnishes the major portion of this contamination, since there are many outhouses along the river and in the drainage area. It was not considered a safe source of supply without some form of treatment and the officer recommended the use of the Canyon Hotel supply or either boiling or chlorinating the water until some better method of providing a safe supply could be obtained.

*Water used by individual camping parties.*—Individual camping parties can secure a good water supply at Mammoth, Upper Geyser Basin, the Lake Hotel and Canyon Hotel, or at springs along the main-traveled roads.

At the time of the survey it was observed that individual camping parties secured their water from the most convenient stream. These open streams located along the main roads of travel are not considered safe for drinking purposes, since they receive not only sewage from hotels and camp sites, but are polluted by outhouses. Samples taken from the Madison River near Riverside Station showed 10 colons per 100 cubic centimeters; Gibbon River at Madison Junction showed 10; Firehole River at Madison Junction showed 100; Gardiner River above the sewers at the fort showed 100; the Yellowstone River at Gardiner showing in a series of five samples, one 10, three 100, and one of 1,000 colons per 100 cubic centimeters. Tower Creek above the falls showed no colons in one case, but 8 in another; Lost Creek at Tower Falls showing 100; Elk Creek at Petrified Tree Road showing 4; Nameless Creek at the road to Tower Falls showing 4 in one case and 2 in another; Goede Creek showing 10 in each of two cases; Black Tail Deer Creek showing 100 in each of two cases; Yellowstone River at the Canyon Camp showing 10 in each of two cases; and Nez Perce Creek at Fountain, soldier stations, showing 100.

Samples numbers, 57 and 58 show that Lewis Lake water should not be used for drinking purposes.

The tourists entering the park at various entrances have to stop at the soldier stations and register and pay an entrance fee and usually secure a water supply. For this reason and in accordance with the request of the medical officer in charge at Fort Yellowstone, the drinking-water supplies of the various soldier stations were examined.

The soldiers at Norris Station secure their water supply from Gibbon River, which supply can not be depended upon. At Riverside Station the supply is taken from Madison River and is highly polluted. The Fountain station supply is taken from Nez Perce Creek and is highly polluted. The supply at Upper Basin Station is taken from the Firehole River below where their toilet and bathhouse discharge into the same river, and, of course, is highly polluted. Thumb Station supply is taken from the west thumb of Yellowstone Lake and can not be depended upon. The Lake Station supply is taken from a creek which flows past the station and drains an area which is subject to various pollution by animal and man. This supply can not be depended upon. The Canyon Station is using a spring located northwest of the station, and there are no conditions on the ground which show probable contamination. Tests of this water show it to be entirely satisfactory for drinking purposes. Tower Falls Station uses a well, and the survey and samples indicate that it is entirely safe. Snake River Station was not reached, due to the impassability of the Snake River Road. The stations at the east entrance and at Soda Butte could not be reached, due to impassable roads. The fact that Gallatin Station is little frequented by tourists and that it would be very difficult to reach made it seem inadvisable to spend the time in going there.

<sup>1</sup>The following springs were tested and a survey made:

Iron Spring.

Apollinaris Spring.

Crystal Spring.

"Good Water" Spring, on the road to Tower Falls.

Spring on the road from Upper Geyser Basin to the Thumb, located 5 miles east of the Upper Geyser Basin.

Spring on the road from Lake Station to Canyon Station, located 7½ miles south of the canyon.

Spring 200 feet northwest of Canyon Soldier Station.

Spring on Firehole River, 1½ miles north of Fountain Soldier Station.

Survey sample No.	Date collected.	Source.	Total bacteria per cubic centimeter.	B. coli per 100 cubic centimeters.
1918.				
1	June 10	Well at Gardiner pump house.	60	10
2	June 10	Tap at Gardiner pump house.	56	100
3	June 11	Yellowstone River at Gardiner.	350	100
4	June 15	do.	400	10
5	June 17	do.	110	100
6	June 19	do.	180	100
7	June 25	do.	68	1,000
8	June 12	Spring which supplies North Gardiner.	36	0
9	June 11	Pipe at trough, North Gardiner.	17	100
10	June 12	do.	95	8
11	June 21	Pond at North Gardiner.	44	100
12	June 21	Tap on North Gardiner supply.	16	4
13	June 9	Well of A. M. Stewart.	3	0
14	June 9	do.	4	0
15	June 9	Well of Kirb Garner.	4	0
16	June 9	Well of L. A. Murray.	2	0
17	June 9	Well of Roxy Bartlett.	1	0
18	June 9	O. S. L. Railway.	60	4
19	June 14	do.	8	2
20	June 14	do.	7	0
21	June 13	Control gate for pipe to fort reservoir.	54	10
22	June 13	End of conduit pipe at Glenn Creek.	4	0
23	June 13	Glenn Creek sluice.	159	6
24	June 13	Glenn Creek.	45	0
25	June 12	Reservoir at Mammoth.	7	0
26	June 12	Mammoth Camp.	31	2
27	June 12	Tap at Supt. Lindsley's office.	22	6
28	June 12	Gardiner River above sewers at fort.	111	100
29	June 12	Gardiner River below sewers at fort.	141	0
30	June 21	Spring for Old Faithful Inn.	5	0
31	June 15	Hamilton's store.	191	0
32	June 19	Spring for Lake Hotel.	1	0
33	June 19	Pipe to Lake Hotel.	0	0
34	June 17	Canyon Hotel.	2	0
35	June 23	do.	1	0
36	June 15	Creek at Geyser Camp.	150	100
37	June 22	do.	52	10
38	June 27	Creek, former Geyser Camp supply.	46	8
39	June 22	Creek from spring at Lake Camp.	360	10
40	June 27	do.	93	1,000
41	June 23	Yellowstone River at Canyon Camp.	58	10
42	June 28	do.	40	10
43	June 28	Spring at Canyon Camp.	15	0
44	June 27	do.	46	8
45	June 13	Apollinaris spring.	4	0
46	June 13	Crystal spring.	5	0
47	June 9	Iron spring.	1	0
48	June 14	Gibbon River at Madison Junction.	36	10
49	June 14	Firehole River at Madison Junction.	143	100
50	June 9	Madison River near Riverside station.	108	10
51	June 19	Well at Yellowstone Camp.	2	0
52	June 21	Spring on Firehole River 1½ miles north of Fountain station.	2	0
53	June 21	Nez Perce at Fountain soldier station.	26	100
54	June 22	Spring, Upper Basin to Thumb, 5 miles east of Upper Basin.	0	0
55	June 22	Yellowstone Lake at Thumb soldier station.	5	2

<sup>1</sup>It is the opinion of the officer making the examination that these springs can be depended upon to give a continuous supply of drinking water.

Survey sample No.	Date collected.	Source.	Total bacteria per cubic centimeter.	B. coli per 100 cubic centimeters.
	1918.			
56	June 27.	Yellowstone Lake at the Thumb.	80	1,000
57	June 27.	Lewis Lake, south end.	25	6
58	June 27.	Lewis Lake, north end.	28	8
59	June 27.	Fish-hatchery main.	64	10
60	June 19.	Creek at Lake soldier station.	50	4
61	June 27.	do.	16	10
62	June 22.	Spring, Lake Canyon, $7\frac{1}{2}$ miles south of canyon.	1	0
63	June 19.	Spring, northwest canyon soldier station.	2	0
64	June 17.	Tower Creek above falls.	16	0
65	June 25.	do.	14	8
66	June 17.	Well, Tower Falls station.	4	2
67	June 25.	do.	6	2
68	June 17.	Lost Creek at Tower Falls station.	34	100
69	June 17.	Elk Creek at Petrified Tree Road.	20	4
70	June 17.	"Good Water" Spring.	18	0
71	June 25.	do.	5	0
72	June 17.	Nameless Creek.	18	4
73	June 25.	do.	20	2
74	June 17.	Goede Creek.	26	10
75	June 25.	do.	21	10
76	June 17.	Black Tail Deer Creek.	136	100
77	June 25.	do.	55	100

### OPERATIONS OF THE SANITARY DISTRICT OF THE NORTH PACIFIC.

During the fiscal year ended June 30, 1918, the sanitary work of the North Pacific interstate sanitary district was continued under the direction of Surg. B. J. Lloyd. The scope of the work is as follows: Water examinations, bacteriological, for common carriers; the survey of watersheds and water supplies used by railroads and other interstate carriers; supervision of the traveling public with reference to the control of contagious diseases; sanitary educational work; investigations and enforcements of interstate quarantine regulations. There are included herein the laboratory examinations of stools of arriving aliens, specimens of Marine Hospital patients, and specimens submitted by the Indian Service.

The travel of two persons suffering from minor contagious diseases was supervised during the year. Two persons were vaccinated against smallpox, six against typhoid fever, and three against paratyphoid.

#### *Laboratory operations.*

Water samples examined for colon bacilli	149
Urinalyses, microscopical	71
Urinalyses, chemical	115
Blood examinations, Wasserman	84
Blood examinations, differential count	2
Blood examinations, red-cell count	11
Blood examinations, white-cell count	14
Blood examinations, Widal	11
Blood examinations, malaria	7
Blood examinations, plague	1
Blood examinations, facillus pestis	2
Stools examined for ova of parasites	5,244
Uncinaria found on primary examination	1,311
Ascaris found on primary examination	1,644
Tricecephalis found on primary examination	3,999
Other parasites found	695
Anaerobic cultures examined, court-plaster, for tetanus	4
Animal inoculations for tetanus	4

Sputum examined, <i>B. tuberculosis</i> .....	83
Pleural effusion examined, <i>B. tuberculosis</i> .....	1
Urine examinations, <i>B. tuberculosis</i> .....	8
Smears examined for gonococci .....	62
Smears examined, <i>B. lepra</i> .....	4
Smears examined, throat meningococci .....	6
Cultures examined, meningococci .....	6
Cultures examined for diphtheria .....	7
Cultures examined, anthrax .....	2
Cultures examined, plague .....	3
Cultures examined, miscellaneous .....	10
Examinations for parasitic skin diseases .....	4
Pathological specimens examined .....	1
Urine inoculations of animals .....	2
Lactose media made .....	10, 500
cubic centimeters	

## EXTENSION OF STEREOPTICON LOAN LIBRARY.

This library, established for the purpose of teaching important lessons in sanitation and demonstrating the principles governing the prevention of disease, has been extensively used during the entire year. Loans have been made to 133 individuals and organizations, and more than 10,000 slides have been in circulation. Based upon voluntary but altogether incomplete returns, it is estimated that these views were shown to audiences numbering at least 150,000 persons, and an examination of the records shows that slides have been forwarded to practically every State in the Union. At the present time there are in circulation 4,079 slides. These photographs have been extensively copied and several lectures have been prepared upon various health subjects to accompany these views.

In connection with war work, the slides have offered a source of information along health and hygienic lines to both the civil and military population. It is to be noted that the slides on rural sanitation have been in especial demand through different Army camps under the direction of a service officer. Sets of slides relative to hygiene of infants and the production and care of milk and various civic activities, such as "clean-up" weeks and malarial activities, are furnished for distribution through the agency of the library.

## ESTABLISHMENT OF A NATIONAL HOME FOR LEPERS.

Legislation was secured February 3, 1917, authorizing the founding of an institution to care for lepers, appropriating \$250,000 therefor. Public-health officials throughout the country were particularly gratified by this step in the public-health legislation, as it has been realized that proper segregation was the only method to cope with the situation, and segregation is advantageous not only from the health standpoint, but it is important economically and from a humanitarian point of view. A suitable site for the establishment of the home for care and treatment of lepers was authorized. By this legislation the selection of the site and administration of the home was placed under the care of the Public Health Service. Provision was made for the reception into said home, under regulations prepared by the Surgeon General, of any person afflicted with leprosy who presents himself for care and treatment. The regulations



governing the institution are to be prepared by the Surgeon General, subject to the approval of the Secretary of the Treasury.

The work of the board has been delayed by reason of the fact that the members all have important duties in addition to those in connection with the selection of the site for the home for lepers. It has been impossible for three members of the board to get away at the same time to make inspection trips. Several inspections have been made by two members and one by a single member. The following sites have been examined:

Penikese Island, off the coast of Massachusetts.

Analostan Island, in the Potomac River, Washington, D. C.

Giesboro Point, in the District of Columbia.

Mount Weather, Va.

The Louisiana Home for Lepers, at Iberville.

The Penikese Island site and the Mount Weather site are practically out of consideration on account of inclement-weather conditions in the winter and the difficulty and expense in connection with furnishing of supplies. The two sites in the District of Columbia remain for further consideration, though probably the Analostan Island site is too small.

This leaves for present consideration the State home for lepers at Iberville, La. The Louisiana legislature has recently passed a resolution providing for the transfer of this institution to the Federal Government for the sum of not less than \$125,000. This site has the advantage of being the location of a going concern, i. e., it is already a lepers' home, and that is the most that can be said for it. The history of the institution shows that a considerable number of patients escape each year, and, as there is no physical isolation, this could be obviated only by a system of guarding, something which it is desirable to avoid if possible.

The availability of this site remains to be determined by the board; if selected it will be necessary to immediately inaugurate extensive construction work, as the institution is already practically filled with patients from the State of Louisiana alone, and to care for those of other States would require a building program which might be exceedingly difficult to carry on during the progress of the war.

The board has felt that the selection of the home was not a particularly urgent matter in view of war conditions, although there has been as little delay as was practical considering the other duties and obligations of the members of the board.

#### RESULTS OF VACCINATION OF THE GENERAL PUBLIC AGAINST SMALLPOX, TYPHOID AND PARATYPHOID FEVER.

During the fiscal year 1915 a department circular was issued by the Secretary of the Treasury offering to all civil employees of the Government whose duties obliged them to engage in interstate traffic or who were engaged in handling mail, free vaccination against smallpox and typhoid fever. During the latter part of the preceding fiscal year conditions brought about by the world war produced a tendency on the part of many individuals to take advantage of the aid extended by the department. The department circular under date of May 16, 1917, offered to the general public free vaccination against either smallpox, typhoid or paratyphoid fever, this vaccina-

tion to be administered at any one of the stations maintained by the Public Health Service, as follows:

1917.

Department Circular No. 83.

Public Health Service.

TREASURY DEPARTMENT,  
OFFICE OF THE SECRETARY,  
Washington, May 16, 1917.

To medical officers of the United States Public Health Service, and others concerned:

Hereafter, as a means of preventing the interstate spread of disease either by military forces or the civil population, any person in the United States may receive, without cost, upon applying in person at those places designated by the Surgeon General of the United States Public Health Service, vaccination against any one or all of the following-named diseases: Smallpox, typhoid fever, paratyphoid fever.

Medical officers and others charged with the duty of performing such vaccination should make requisition for the materials necessary therefor, and shall render a monthly report showing the names of those so vaccinated, their addresses, and the date of said vaccination. Upon the request of any person so vaccinated certificate of vaccination may be issued.

(Signed) W. G. McAdoo, *Secretary*.

The following tabulated record gives, to a degree, the results obtained during the fiscal year in administering such vaccination to the general public. All vaccines other than smallpox virus are prepared in the Hygienic Laboratory, thus insuring a high quality and potency of the products.

Record of vaccinations made during fiscal year July 1, 1917, to June 30, 1918.

Station.	Small-pox.	Ty-phoid.	Para-typhoid.	Station.	Small-pox.	Ty-phoid.	Para-typhoid.
Albany, N. Y.		48		Milwaukee, Wis.		1	
Alexandria, Va.		3		Mobile, Ala.	52	181	
Anniston, Ala.	13,627	1,175		Nashville, Tenn.		11	
Ashtabula, Ohio.	3	20	22	Natchez, Miss.	46	81	
Baltimore, Md.	95	199		New Bedford, Mass.	1	2	
Boglety, Mich.		6		New Bern, N. C.	1	740	
Boston, Mass.	19	330		New Orleans, La.	5	41	
Cairo, Ill.		128		Newport, Ark.		15	
Cleveland, Ohio.	25	24	24	Norfolk, Va.	169	656	
Charleston, S. C.	13	43		North Bend, Oreg.	5	23	
Crestfield, Md.		2		Pensacola, Fla.		6	
Des Moines, Iowa.	4,393	1,901		Petersburg, Va.	352	400	
Duluth, Minn.		4		Perth Amboy, N. J.	164	261	
Eagle Pass, Tex.	217	25		Port Huron, Mich.	421	3	
Eastport, Me.	1,755	2		Portland, Me.	8	10	
Eastport, Mo.	1			Portland, Oreg.		2	
Elizabeth City, N. C.		1		Providence, R. I.	7	16	
Ellis Island, N. Y.		1		Provincetown, Mass.	5	9	
Fortress Monroe, Va.		2		Reedy Island, Del.	1	6	
Galveston, Tex.	57	91		Riehmond, Va.	35	333	218
Grand Haven, Mich.	52	22		Saginaw, Mich.	3		
Gulfport, Miss.	4	51	3	San Francisco, Cal.	7	4	
Hattiesburg, Miss.	803	240		San Diego, Cal.		2	
Hidalgo, Tex.	413	260		San Juan, Cuba		48	
Honolulu, Hawaiian Islands.		131		Sault St. Marie, Mich.	13	20	
Juneau, Alaska.		5		Savannah, Ga.	44	249	21
Kansas City, Mo.	1,993	98	7	Seattle, Wash.	1	6	3
La Crosse, Wis.	123			Solomons, Md.		5	
Lexington, Ky.	240			St. Johns River.		44	
Little Rock, Ark.	284	287	5	St. Louis, Mo.	60	23	
Los Angeles, Cal.		32		Stapleton, N. Y.		24	
Louisville, Ky.	6	15		Superior, Wis.	16	40	2
Ludington, Mich.	17	14		Taeoma, Wash.		1	
Macon, Ga.	29	1		Vineyard Haven, Mass.	8	1	

## PROGRESS IN PUBLIC HEALTH NURSING.

On November 12, 1917, Miss Mary E. Lent was appointed supervising nurse in the United States Public Health Service, and through her efforts much has been accomplished toward stimulating and standardizing the public health nursing work of the service, in which there has been maintained the closest cooperation with the Red Cross, State, and local health authorities.

The supervising nurse is directed through the bureau to inspect the nursing service in the various extra-cantonment zones and advise and suggest cooperative measures which are undertaken by the agencies in charge of sanitation in the zones. After visiting each zone and completing a survey of the situation, recommendations were forwarded to the bureau which incorporated the following general lines:

1. That the chief nurse should be free to respond to calls and to appear before all private and city organizations in regular or special meetings to explain the purpose and methods of the Public Health Nursing Service.

2. That the public health nurse should not be called upon to do institutional work in the hospitals for communicable diseases maintained by the United States Public Health Service.

3. That the inspector of school children be assisted by at least one public health nurse.

4. That an experienced public health nurse be engaged to follow up reported cases of venereal diseases.

The following report gives a general idea of the work accomplished during the fiscal year:

Station.	Conferences.	Talks.	Interviews.	Visits.	Total.
Alexandria, La.....	20	10	6	12	48
Anniston, Ala.....	10	19	1	6	36
Atlanta, Ga.....	21	2	2	5	30
Augusta, Ga.....	10	5	5	7	27
Charlotte, N. C.....	21	8	8	7	44
Chattanooga, Tenn.....	20	5	4	4	33
Chillicothe, Ohio.....	13	3	2	8	26
Des Moines, Iowa.....	15	2	3	3	23
Fort Worth, Tex.....	26	3	15	9	53
Hattiesburg, Miss.....	10	8	2	3	23
Houston, Tex.....	21	3	5	.....	29
Leavenworth, Kans.....	16	2	6	14	38
Little Rock, Ark.....	68	4	13	6	91
Macon, Ga.....	20	12	15	8	55
Manhattan, Kans.....	18	1	10	8	37
Montgomery, Ala.....	12	2	2	10	26
Newport News, Va.....	22	15	2	8	47
Petersburg, Va.....	24	4	2	10	40
San Antonio, Tex.....	29	.....	40	2	71
Spartanburg, S. C.....	10	3	2	9	24
Waco, Tex.....	15	2	.....	6	23
Louisville, Ky.....	48	9	2	13	72
Total.....	469	122	147	158	896

## PROGRESS IN VENEREAL-DISEASE CONTROL.

Immediately after the United States entered the war the problem of importance of venereal-disease control among the military forces became apparent. The Public Health Service in taking over the sanitation of civil districts adjacent to large Army camps was soon

confronted with this problem. The American Red Cross came to the rescue by providing funds to aid in the establishment of clinics for the treatment of persons suffering from venereal diseases. These clinics were operated under the direct supervision of the United States Public Health Service officer having charge of sanitation in the area. The Red Cross furnished necessary equipment and certain personnel, including laboratory technicians and nurses. It also provided arsphenamine in some instances. The Public Health Service furnished the medical attention necessary. These clinics were started in December, 1917, and up to July, 1918, 25 of them had been placed in active operation at the following localities:

Alexandria, La.	El Paso, Tex.	Montgomery, Ala.
Anniston, Ala.	Fort Worth, Tex.	Newport News, Va.
Atlanta, Ga.	Greenville, S. C.	Petersburg, Va.
Augusta, Ga.	Hattiesburg, Miss.	Portsmouth, Va.
Chattanooga, Tenn.	Houston, Tex.	San Antonio, Tex.
Charlotte, N. C.	Jacksonville, Fla.	Spartanburg, S. C.
Chillicothe, Ohio.	Louisville, Ky.	Waco, Tex.
Columbia, S. C.	Leavenworth, Kans.	
Des Moines, Iowa.	Macon, Ga.	

Approximately 10,370 people had been treated in these clinics at the close of the fiscal year. Study of the problem as connected with the extensive work carried on in extra-cantonment zones, and also as shown in reports from the Surgeon General of the Army, indicated that the chief source of venereal diseases resided in the civil population and that any plan to be effective must be extended so as to include not only the cities adjacent to large Army camps but also every city and hamlet in the Union.

The States of California and Massachusetts had already inaugurated a comprehensive plan for dealing with venereal diseases. Conferences with the Surgeons General of the Army and Navy and with many State health officers, as well as other interested and well-informed persons established the fact that some such plan as that inaugurated in the before-mentioned States should be put in practice in every State of the Union. Consequently there were compiled suggestions and State board of health regulations for the prevention of venereal diseases. These suggestions closely followed the State-wide plan for the prevention of venereal diseases introduced in Massachusetts by Commissioner of Health Allan J. McLaughlin. They were approved by the Surgeons General of the Army, Navy, and Public Health Service and were printed in the Public Health Reports March 29, 1918.

The ground had already been prepared for action before the formulation of these suggestions. Early in January a telegram from the Surgeon General of the Public Health Service was directed to all State health officers, in which their cooperation in the matter of venereal-disease control was requested.<sup>1</sup> The hearty and universal response to this telegram encouraged the preparation above referred to. These suggestions for the State board of health regulations declared venereal diseases to be dangerous to the public health and embraced 10 principal features, as follows:

- (1) Venereal diseases to be reported.
- (2) Patients to be given information concerning the nature of their diseases and the necessity for treatment until cured.

<sup>1</sup> See Public Health Reports, January 1, 1918.

- (3) Investigation of cases with the view of obtaining information as to the sources of infection.
- (4) Provision for the protection of others from infection by venereally diseased persons by means of—
  - (a) Quarantine of infected persons who by their habits are a menace to others.
  - (b) Measures to fix the responsibility of a person about to be released from quarantine so that he or she should be compelled to continue treatment until cured.
- (5) Conditions which make it possible to preserve in secret the name of individual affected with a venereal disease so long as he or she does not menace the public by his or her habits.
- (6) Prohibition of drug store prescribing for venereal diseases.
- (7) The spread of venereal diseases to be declared unlawful.
- (8) Prostitution declared a prolific source of venereal disease and its repression to be considered a public-health measure.
- (9) Certificates of freedom from venereal diseases to be prohibited.
- (10) Records to be secret.

In addition to the foregoing essential features for State board of health regulations for the prevention of venereal diseases, it was suggested that provision should be made for the punishment of violation of the regulations; that provision for treatment in suitable hospitals while patients are under quarantine should be made at public expense; that for enforcement of these regulations a bureau or division of venereal diseases should be established in the State health department; that the issuance of arsphenamine at public expense should be encouraged; that provision should be made for the examination of prisoners for venereal-disease infection and treatment of such prisoners; that laboratory tests for syphilis and gonorrhea should be made for physicians in the State health laboratories; that due provision should be made for follow-up and social-service work in connection with the prevention of venereal diseases; that institutions should be provided for the segregation of venereal-disease carriers whose conduct could not be adequately controlled in any other way; that the floating or passing on of persons having venereal diseases from one community to another be prevented; and, finally, that the Bureau of Venereal Diseases carry on a campaign of public education in venereal-disease prevention and in the conditions responsible for the dissemination of these diseases.

The response to these suggestions was immediate and gratifying. Inquiries began to come to the bureau so rapidly and appeals for help followed in such rapid succession that the personnel in the Division for Domestic Quarantine, in which these activities were centered, was found inadequate for the proper conduct of the work. Passed Asst. Surg. J. G. Wilson was therefore relieved from duty at Leavenworth, Kans., and ordered to report to the bureau to assume charge of a venereal-disease campaign. On April 25 the following telegram was sent to State health officers:

As a result of conference with the Surgeon General of the Army, the Public Health Service will appoint a man in your State to assume charge of venereal-disease control under your direction, you to be consulted as to appointment.

Salary to be paid by State and Federal Government jointly, according to special needs, but appointee to wear uniform of Public Health Service officer. Wire if such cooperation desired and letter will follow.

This telegram resulted in a large number of acceptances of the offer and many inquiries for further details. Letters were written to all the State health officials explaining the telegrams and Public Health Service officers detailed to confer with State health officers in order to further explain the plan and perfect arrangements for its execution. The details of the plan were briefly set forth in the following memorandum:

#### EXPLANATION OF ORGANIZATION OF WORK.

There should be a division or bureau of venereal disease created in the State health department and the work should be undertaken along the general lines indicated in bureau letter to the State health officer. This bureau should have its activities grouped under the following headings:

1. Notification of cases of venereal disease to the health authorities.
2. Repressive measures looking toward isolation and treatment in detention hospitals of infected persons who are unable or unwilling to take measures to prevent their becoming a menace to others; also measures for the suppression of prostitution.
3. Educational measures, including measures for informing the general public, as well as infected individuals in regard to the nature and manner of spread of venereal diseases and the steps that should be taken to combat them.
4. Extension of facilities for early diagnosis and treatment. State to be systematically divided and organized for this purpose with representatives of the division of venereal disease in charge of the work in each area.

The time is opportune for immediate active cooperation between the Public Health Service and State departments of health in carrying out all the measures mentioned under the four preceding heads. It is believed, however, that the whole program can be most advantageously carried out if special stress is laid upon the last feature, because with the organization of each State into districts and the establishment of venereal clinics in strategic areas the machinery necessary for the entire plan will automatically be set in motion. Although the operation of this machinery will at first undoubtedly be imperfect, the following twofold results should be immediately accomplished:

First. Establishment of centers for carrying out workable regulations on reporting and the institution of repressive and educational measures appropriate to particular communities.

Second. Immediate reduction in venereal-disease foci with a marked decrease in the prevalence of such diseases in both the civilian and military population.

The first aim, therefore, of the State bureau and division of venereal diseases should be to establish a chain of venereal-disease clinics. The operation of these clinics should be standardized according to methods to be presented and agreed upon at the State health officers' conference in June, but in the meantime it is not advisable to await the perfection of all the details before starting the work.

As a result of the foregoing activities the following 24 States had made definite arrangements by the end of the fiscal year to cooperate with the Federal Government by having an officer of the Public Health Service to assume charge of the venereal-disease control under the joint supervision of the State health department and the United States Public Health Service:

Alabama.	Kentucky.	Montana.
Arizona.	Louisiana.	New Hampshire.
Arkansas.	Maine.	Ohio.
Colorado.	Massachusetts.	Oregon.
Florida.	Minnesota.	Rhode Island.
Georgia.	Mississippi.	South Carolina.
Indiana.	Missouri.	Virginia.
Iowa.	Maryland.	Washington.

The officers in charge of this work were informed by circular letter that the campaign for organization embraces the following four principal features, and they were instructed to submit monthly reports covering the activities along these lines:

(1) Educational: Acquainting the public with the nature of the diseases and the objectives to be accomplished.

(2) Law enforcement: Securing cooperation of the physicians in reporting cases, and of the police in apprehending prostitutes, vagrants, and such other persons as can be reasonably suspected of having venereal disease in communicable stages.

(3) Propaganda to secure local funds for providing detention homes and hospital facilities for isolation and treatment of venereal-disease carriers who by their habits are a menace to the public health.

(4) Establishment of increased facilities for early diagnosis and treatment.

In addition to the activities mentioned, definite progress was made in the following phases of the work:

(1) Better cooperation between the personnel of the Commission on Training Camp Activities and the Public Health Service officer engaged in extracantonment sanitation; (2) provision for the treatment of United States prisoners by cooperation with the Department of Justice; (3) distribution of free arsphenamine to clinics operated under joint State and Federal control.

The great importance of the problem with the ever-increasing difficulties attendant upon proper solution thereof soon made it apparent that lack of detention homes for the treatment of venereal-disease carriers would seriously impede the proper carrying out of the program. Besides this it also became apparent that the States would not have sufficient funds in many instances to carry on any educational propaganda in connection with the work. Moreover, it was becoming increasingly difficult to secure adequate personnel to carry on the program either in its treatment or educational features. This lack of personnel was largely due to the fact that the Army was making large inroads upon the medical, nursing, and teaching professions of life, leaving the civilian population necessarily suffering under this handicap. At the same time that these difficulties were realized there was also an increasing realization on the part of the public of the importance of the problem. Many conferences were held, both official and unofficial, with the view to determining what might be done to better the situation. It was finally decided that Congress should be asked to appropriate sufficient funds for carrying out the program. At the annual meeting of the State Health Officers' Conference, held in June, the matter was thoroughly discussed, and as a result of conferences held both before and at the time of this meeting a bill was drafted which had the sanction of representatives from the Council of National Defense, and the Surgeons General of the Army, Navy, and Public Health Service. This bill was introduced into Congress before the end of the fiscal year, but was not finally passed until July 9, 1918. It was known as the Army appropriation bill. It created an Interdepartmental Social Hygiene Board of which the Secretaries of War, the Navy, and Treasury, and the three Surgeons General were members. The Interdepartmental Social Hygiene Board was to have general supervision of the venereal-disease situation and formulate rules for the expenditure of Federal

funds. In it also was vested power to specify what institutions should receive money appropriated under this act for the purpose of the further investigation of the causes and prevention of venereal diseases. In addition to the creation of the Interdepartmental Social Hygiene Board, this act also provided for the creation of a Division of Venereal Diseases in the Bureau of the Public Health Service and appropriated \$200,000 for the administration of this division. The act also appropriated \$1,000,000 to be spent under the direction of the Treasury Department by the various States, each State to receive as its share of the allotment a sum in proportion to the ratio of its population to that of the entire United States. One million dollars was also appropriated to be expended by the Secretaries of War and the Navy according to regulations which should be formulated by the Interdepartmental Social Hygiene Board.



## EXTRA-CANTONMENT SANITATION FOR THE PROTECTION OF THE MILITARY FORCES.

The obligation to protect the health of the military forces in civilian territory was placed upon the Public Health Service by Executive order and by act of Congress. To maintain the efficiency of the fighting forces it is essential to safeguard their health outside the cantonment and camp boundaries. It is just as essential to establish and maintain proper sanitary conditions in the extra-cantonment areas as to secure proper sanitary conditions within the camp itself. By proper sanitary conditions is meant the reduction of the disease hazards of the soldier or sailor to the minimum.

To secure this reduction of disease hazards involves the establishment of an efficient health department or organization in areas to which the soldier or sailor has access. Within the camp boundaries such an organization is maintained by the Army Medical Corps, and it is comparatively easy to secure proper sanitary conditions and to establish the necessary sanitary safeguards within an area which is exclusively under military control. To secure a like measure of protection in the civilian areas surrounding camps is a complex problem and one much more difficult of solution.

This duty of protection of the health of the military forces in civilian areas contiguous to the camps has been performed by the Public Health Service.

The scope of the work involves proper supervision over water, food, and milk supplies in the areas to which the soldier or sailor has access, the proper disposal of human excreta in such areas, and the elimination of breeding places of flies and mosquitoes. It involves also efficient control of communicable diseases and the reduction of the prevalence of these diseases to a minimum. It is the policy of the bureau to utilize to the fullest extent existing State and local health organizations and to encourage their legitimate expansion with the idea that the intensified public health activity resulting from cooperation of Federal, State, and local authorities after the Federal force is withdrawn.

The necessity for prompt protection of the health of the soldier was so pressing that in some instances it has been necessary to do some work in cities which should and eventually will be done by the local authorities, but in the main the work done has been necessary because of the sudden placing of Federal military camps in these areas and is, therefore, a proper charge against Federal appropriations.

The officers in charge and a large part of the personnel are furnished by the Public Health Service supplemented by personnel and funds from the American Red Cross. This Federal organization dovetails into the existing local health machinery in making up the complete sanitary unit. Obviously the amount of work actually

done by Federal officers and employees varies in the different zones in inverse ratio to the amount of work which State, city, county, or other local authorities are able and willing to do. In this work 49 commissioned medical officers and 72 acting assistant surgeons are now engaged. These with sanitary engineers, scientific assistants, epidemiologists, sanitary inspectors, and public health nurses make up a total force of over 500 exclusive of laborers.

In reducing the hazard to the soldier and sailor from communicable disease of all kinds special effort was necessary to combat malaria and venereal disease.

Measures for the prevention of malaria have been very successfully carried out and ample protection afforded to the military forces as a result.

A program for combating venereal diseases has been formulated and put into effect upon a Nation-wide basis. It has been recognized that this is largely a civilian problem and that real success can be secured only by the concerted action of all civilian health agencies according to a uniform program in all States, directed by the Federal Public Health Service. Congress authorized the establishment of a Division of Venereal Disease in the Bureau of the Public Health Service and appropriated \$200,000 for its maintenance. Congress also appropriated \$1,000,000 for allotment to the States for the suppression of venereal disease, \$1,000,000 to assist States in caring for persons detained because of venereal disease and adequate sums for research to secure better methods of eradication.

At military cantonments in all locations where conditions are or are liable to become favorable to the spread of malaria campaigns are being conducted to prevent the occurrence of this disease. The introduction of large forces of labor from malaria-infested regions produce new conditions at cantonment cities and extra precautionary measures become essential.

Similar campaigns have been and are being planned for near naval stations, aviation camps, munition plants, ship-construction yards, and other important war industries.

It is not sufficient to protect soldiers, sailors, and skilled laborers only within the boundary lines of cantonment or industrial plants, as previous war history indicates definitely that epidemic disease is contracted not so much in reservations under military or naval control as in municipal areas with little or no proper sanitary control.

All localities near cantonments, etc., where large numbers of Naval or Army men or war-industry employees are or congregate after sundown in potential malaria districts, are receiving such attention as is essential.

In connection with the sanitation of the extra-cantonment areas, the State, county, and city authorities have taken proper advantage of this opportunity to eliminate malaria in their communities, and many have made liberal financial contributions to that end.

Usually an area about 1 mile wide surrounding the cantonments and the near-by city or village has been kept free from malaria-bearing mosquitoes as well as the city.

The broad scope of this work has made it perfectly safe for our sailors and soldiers to visit all parts of the extra-cantonment towns. The inhabitants of these towns have noted the marked reduction or

absence in mosquito life, and the physicians report a very large decrease in the prevalence of malaria as compared with previous seasons. The decrease of malaria at Habana, Cuba, on the Isthmus, and in the Federated Malay States, where antimalaria campaigns were properly conducted, was followed immediately by a pronounced decrease in the sick rate and death rate from other causes.

Within the cantonments proper similar antimalaria measures are being carried out by the Medical Corps of the Army and the Navy.

The work being accomplished consists of the drainage of swamps, wet areas, and seepage outcrops by specially trained sanitary engineers; the proper clearing, training, and regrading of natural water-courses; the application of oil at definite periods to all remaining mosquito-breeding places; and the modification and systematic treatment of the shore lines and shallow parts of large lakes and ponds, together with the proper maintenance measures necessary. Even skilled engineers must have special training and experience to accomplish this work as it should be done.

In the areas near which some of the cantonments have been located many cases of malaria were reported to have been present each year previous to the construction of the camp, and since the antimalaria campaigns were inaugurated very few or no new cases of malaria have been contracted.

In addition, the chambers of commerce, prominent citizens, business interests, as well as the officials of these important southern cities, have seen the advantage of having their cities free of malaria and mosquitoes, and a growing demand to have similar work done in near-by localities has occurred.

A survey at one of the aviation-camp sites previous to its acceptance showed all families living on the property had one or more cases of malaria last season, and *Anopheles* were very numerous. This year in the same identical territory the commanding medical officer reports no new cases of malaria contracted and an absence of *Anopheles*.

The area protected by malaria-control measures varies with the size of the cantonment and the cantonment town. The smaller areas consist of 8 to 15 square miles, and the largest ones have been as extensive as 90 square miles.

In those cantonment towns whose normal growth was seriously retarded by malaria, accompanied by the mosquito pest, the business interests have seen thousands of American soldiers live among them with practically no malaria and now understand that the labor forces of industrial plants can be kept in similar efficient condition at a reasonably low cost. The total amount of malaria contracted by our troops at southern cantonment cities to-day as compared to that of our previous war period (in 1898) is practically zero.

In the following report of the sanitary work performed by the Public Health Service during the fiscal year in the various extra-cantonment zones due credit should be given to the various agencies cooperating in this work. City and local authorities, the Department of Agriculture, and other public agencies have assisted materially in the work of protecting the health and improving the surroundings of the civil and military population in these zones.

Hearty cooperation has been rendered by the American Red Cross. Soon after the declaration of war there was organized the Bureau of

Sanitary Service with a commissioned officer of the Public Health Service as director. Through this bureau funds have been advanced for the establishment of sanitary units which were operated under the direction of officers of this service in extra-cantonment zones. This financial assistance enabled the Public Health Service to immediately establish adequate inspection and nursing activities in zones which had become overcrowded on account of the many soldiers and their families being brought into the areas.

To the close of the fiscal year the American Red Cross had advanced approximately \$500,000 for the establishment and maintenance of the 32 sanitary units throughout these extra-cantonment zone areas, without which assistance the work could not have been started for a period of several months in some instances.

For convenience the different extra-cantonment zones have generally been given the name of the important camp for the protection of which the zone was established. However, many of the zones not only surround more than one camp, but have in their midst countless important war industries. It has been the aim to protect the health of workers in these industries as well as to protect the health of soldiers. In addition to this system of designating the name of the nearest large city is also given.

In view of the broadness of public health work and of the many kinds of activities involved it has been impossible in this report to cover all of the work done in these zones. Therefore the features representing the salient points in the work have been emphasized.

#### CAMP BEAUREGARD ZONE, ALEXANDRIA, LA.

*Malaria control.*—The preliminary survey of Alexandria and the zone about Camp Beauregard was made during August, 1917. Extensive mosquito propagation was found throughout the entire area and in the gutters of 50 per cent of the city blocks. Malaria-control work commenced January 10, 1918, in cooperation with State and local health authorities.

At the end of the fiscal year adequate control was being maintained over city and suburban breeding. Although it was found impossible to check breeding in rural districts as effectively as in city districts, sufficient control was being maintained at the end of the fiscal year to give assurance that there was extremely little propagation in the 1-mile zone. Practically all enterprises maintaining mill ponds have been compelled to place the ponds in such condition as to prevent mosquito propagation. It has been decided to enlarge the antimalaria zone in the region of Tioga.

The topography of the country is such that even with construction so planned to withstand storm conditions as effectively as possible, it will be necessary to employ one gang for maintenance purposes throughout the year. The entire district has been laid off into zones with definite boundaries. These zones have systematic inspection and oiling at definite periods.

Under the porch of a house near the base hospital 133 adult *Anopheles* mosquitoes were counted at one time in August, 1917. Following the antimalaria work the highest count for this place was 12 in May and 4 in June. This is believed to be a fair index of the prevalence of malaria mosquitoes last year and this.

## CAMP BOWIE ZONE, FORT WORTH, TEX.

The work in this extra-cantonment zone was started October 12, 1917, in cooperation with the State and local health authorities and the Red Cross.

*Malaria control.*—The zones for antimalaria work have been one around Camp Bowie, which is located just outside and west of Fort Worth, and one around each of the aviation fields, one at Hicks, 12 miles north; one at Everman, 9 miles southeast; and one at Benbrook, 8 miles southwest. Some work has also been done in Fort Worth.

Work was commenced about the 10th of May, 1918. By the end of June a force of 7 foremen and 85 laborers were at work. Draining and clearing operations were supplemented by oiling, for which a mixture of crude oil and kerosene was used.

When the malaria problem was first looked into, it appeared necessary to control about 702,000 feet of ditches and streams. At the end of the fiscal year work was completed on 394,060 feet of streams and ditches, and, through the use of oiling, the total amount of streams and ditches under control had been raised to 503,860 feet—72 per cent of the streams and ditches which were breeding freely.

*Rural sanitation.*—On May 14, 1918, activities in regard to rural sanitation were commenced, consisting of a house-to-house survey of homes and arrangements for the installation of sanitary privies where needed. The double-compartment concrete-vault type was recommended. Up to the end of the fiscal year 177 homes, 24 stores, 3 schools, and 3 churches had been surveyed; 548 pamphlets had been distributed; 56 new privy houses had been built; 24 old houses had been remodeled; 180 privies had been sanitated; and work had been finished or started on 363 privies.

*Control of milk supplies.*—The control of milk supplies for Camp Bowie zone was begun about the middle of January, 1918. When the service took hold, a systematic inspection of all dairies was made and a score card from the Bureau of Animal Industry used to keep records of the improvements made. Samples of milk were collected regularly, and the ordinances were gradually enforced, to secure a better milk supply without reducing the production. By the end of the fiscal year 82 farms had been scored, 255 inspections made of farms, 170 samples of milk collected, 320 sediment tests made, 2,380 cows tested for tuberculosis, and 27 inspections made of creameries.

*Control of food supplies.*—Regulations which went into effect on June 1, 1918, were responsible for the almost complete screening of all food establishments and the general sterilization of utensils, together with the universal use of paper cups or sterilized spoons and glasses in soda fountains. Before the regulations went into effect proprietors of food establishments agreed that they were reasonable. Certification cards were given to all complying with them, and a military police was stationed to prevent patronage by soldiers in the case of those not complying. During the fiscal year 2,193 inspections were made, 1,587 orders were issued, compliance was secured in 1,263 cases, and 17 guards were stationed for short periods before eating places.

*Medical inspection of school children.*—Medical inspection of school children was commenced in January, the parents being noti-

fied of existing defects. Eighteen schools were inspected, 7,475 children examined, 7,408 physical defects found, and 4,186 notices sent to parents. Owing to the prevalence of smallpox in school in January and February the principals of some of the schools requested that the service vaccinate school children whose parents desired it. Vaccination in school became very popular.

*Public health nursing.*—Public health nursing work was established in December, 1917, being limited at first to examination and vaccination of school children and some investigation of cases of disease reported by doctors. Later the work was enlarged, instruction and demonstrations were given to cases of communicable diseases, absentees from school were looked up, and vaccinations were carried out. During the year 597 new patients were visited, 799 instruction visits were made, 65 school visits were made, and 391 follow-up visits were made.

*Laboratory.*—An increasing amount of laboratory work is being done. During the fiscal year 1,435 examinations were made.

*Control of communicable diseases.*—Circular letters were sent out to secure better reporting, which is fairly complete at the present time. A complete set of case and epidemiological records have been kept of all communicable cases investigated.

A total of 3,075 vaccinations against smallpox were carried out in the schools and homes. During June 703 antityphoid inoculations were given.

Active efforts were made toward the control of respiratory infections by tracing absentees from school, supervising quarantine, and inspecting schoolrooms in which exposures existed.

*Control of venereal diseases.*—A Government clinic was organized in April to treat indigents and charity cases.

*General sanitation.*—A house-to-house canvass was made in the city of Fort Worth, 20,128 buildings, 73,933 persons, 2,351 stables, 2,959 mules and horses, 1,901 cows, and 282 hogs being inspected. Practically all of the stables inspected had exposed piles of manure. A total of 28,431 persons were found to be living without sanitary means for excreta disposal. In May the city passed a sanitary privy ordinance, providing boxes and cans with an adequate scavenger service. Five disposal stations were built at various points in the city, places were inspected, and orders issued for privies and water-closets. On request of the service, ordinances were passed by the city commissioners providing for the proper disposal of stable manure and the abolition of common drinking cups and roller towels in public places. These ordinances have been complied with. Supervision was maintained over the public water supply.

#### BREMERTON ZONE, SEATTLE, WASH.

An extra-cantonment zone was established in Bremerton and vicinity on January 17, 1918, in cooperation with the State and local health authorities.

*Control of milk supplies.*—Up to the end of the fiscal year 39 inspections had been made of dairies and 28 of milk depots.

*Control of food supplies.*—In the course of efforts to enforce sanitary control over food establishments, the following inspections were

made: Restaurants, 355; bakeries, 402; meat markets, 86; ice cream and soda parlors, 298; delivery wagons, 12; grocery stores, 11.

*General sanitation.*—During the fiscal year 77 inspections were made of barber shops, 36 of manicuring parlors, 145 of hotels and rooming houses, 55 of garbage, 10 of laundries, and 10 of the navy yard. Thirty-two samples of water were collected and analyzed, and one supply was condemned. The total number of inspections, including those in regard to milk and food control, was 3,454. As a result 647 nuisances were found, 284 nuisances were abated, 1,153 notices were served, and 416 health certificates were issued.

#### INSPECTION OF ENVIRONMENT OF MILITARY CAMPS IN CONNECTICUT.

Under orders of July 5, 1917, Surg. G. W. McCoy, director of the Hygienic Laboratory, made an inspection in company with State Health Commissioner John T. Black of the environment of military camps in Connecticut. Special attention was given to conditions at New London and Bridgeport, and advice was given as to the manner in which conditions could be improved.

#### CAMP DEVENS ZONE, AYER, MASS.

The service, assisted by the Red Cross, assumed charge of sanitation in the zone surrounding Camp Devens on January 1, 1918, relieving the Massachusetts State department of health of this work. The zone comprises 10 towns, the health authorities of each co-operating in the work: Ayer, Groton, Harvard, Lancaster, Littleton, Lunenburg, Pepperell, Shirley, Townsend, and Westford, and covers an area of approximately 150 square miles, with a population of approximately 20,000. No town larger than 3,000 is contained in the zone.

*Malaria control.*—Some Anophelines have been found breeding in the zone, and there are malaria carriers among the soldiers in camp. Antimalaria work has included the use of spray pumps and drip cans. Very satisfactory results have been secured.

*Rural sanitation.*—During the fiscal year, 568 premises were inspected.

*Control of milk supplies.*—During the fiscal year, 21 dairies were inspected.

*Control of food supplies.*—During the winter attention was devoted particularly to restaurants, "soft"-drink establishments, delicatessen stores, and meat shops. In cooperation with the local boards of health regulations were put in force governing these places. By the end of the fiscal year, 374 restaurant inspections had been made, 208 soda-fountain inspections, 21 meat-market inspections, and 49 grocery inspections. One restaurant was closed temporarily.

*Medical inspection of schools.*—Under State law medical inspection of schools is conducted by the local school physicians. The service has cooperated in this work. In the fiscal year 18 schools were under inspection, 1,279 children were examined, 904 defects were found (of which 628 were defective teeth and 195 tonsils), 102 notices were sent to parents, and 45 physical defects were corrected.

*Public-health nursing.*—The public-health nursing force holds

itself in readiness to respond to emergency calls and assists in medical-school inspection in those towns which do not have public-health nurses. During the year, 453 instruction visits, 317 school visits, and 426 follow-up visits were made.

#### CAMP DODGE ZONE, DES MOINES, IOWA.

The 5-mile zone around Camp Dodge includes the townships of Jefferson, Madison, Crocker, Saylor, and Webster, Polk County. Sanitary work was carried out in this zone by the service in cooperation with the State and local health authorities and the Red Cross.

*Rural sanitation.*—In the 5-mile zone around the camp a concrete-vault type sanitary privy has been installed at every house. Furthermore, in the incorporated towns of Urbandale, Grimes, Polk City, and Granger and at the coal mines located at Carney and Or-labor concrete-vault type sanitary privies have been installed at every house. In the incorporated town of Ankeny a sanitary sewer system for the entire town is being installed.

*Control of food supplies.*—The camp adopted regulations that soldiers could patronize no restaurants, soda fountains, and ice-cream parlors, or barber shops not certified by the service. Under this ruling 279 certificates were issued to food establishments. In three instances it was necessary to have a military guard placed in front of a restaurant for a few hours. Medical inspection of food handlers was begun during the week ending June 22.

*Medical inspection of schools.*—Since February 23, 1918, when the inspections began, 1,296 school children have been examined. Daily visits to each of the schools have been made to ascertain the presence of communicable diseases among the pupils.

*Public-health nursing.*—Public-health nurses have made 626 home calls and investigated 1,182 cases of communicable diseases. Two epidemics of measles were investigated by the nurses. On June 1 a coordinated nursing service was established, participated in by the Red Cross, the city health department of Des Moines, the Public Health Nursing Association, and board of education, and the Public Health Service. In this way 16 public-health nurses were available.

*Laboratory.*—Up to June 11, 1918, laboratory facilities were furnished by the Des Moines Water Co. and the Mercy Hospital. At that time a service bacteriologist was assigned to the State laboratory, at which the laboratory work for the zone has been conducted.

*Control of communicable diseases.*—Morbidity reports are obtained both from the physicians of the zone and from the Des Moines health department.

For the control of smallpox and typhoid fever 5,253 persons were vaccinated against smallpox and 4,891 inoculations of typhoid vaccine were administered. All persons employed in restaurants, bakeries, candy and ice-cream factories have been inoculated against these diseases. All employees of barber shops have been vaccinated against smallpox.

*Control of venereal diseases.*—A clinic was established on January 21, 1918. At this clinic 408 persons suffering with venereal disease have received treatment and advice. The average daily attendance is 35.



## CAMP DONIPHAN ZONE, LAWTON, OKLA.

Sanitary supervision of the extra-cantonment zone at Camp Doniphan (Fort Sill) was undertaken by the service on March 28, 1918, on which date the detail of a military health officer in Lawton, Okla., was ended. The work was done in cooperation with the State and local health authorities and the the Red Cross.

*Malaria control.*—On June 21 a preliminary malaria survey was made in Lawton and vicinity, but no Anophelines or Anopheles larvæ were found, owing to the small number of watercourses and the slight amount of rain. Malaria in this zone can be easily controlled.

*Rural sanitation.*—Plans were laid for a demonstration in rural sanitation on a cooperative basis during the next fiscal year.

*Control of milk supplies.*—Rules and regulations governing the production and handling of milk have been issued, and the dairies given until July 4 to start the changes necessary to meet the requirements.

*Control of food supplies.*—Inspection of food and drink establishments has been carried out; rules and regulations have been issued, and these are being put into effect. During the fiscal year 152 sanitary notices were served. Places of a grossly insanitary nature had provost guards placed before them to keep out men in uniform.

*Laboratory.*—At present laboratory examinations to determine whether detained women are venereally infected are made by the medical officer in charge in the office of the county superintendent of health. Other necessary laboratory work is done in the laboratory of the State department of health, Oklahoma City.

*Control of communicable diseases.*—Every effort has been made to improve the reporting of diseases which has been very poor in Comanche County. Reported cases have been investigated, instructed, and quarantined according to the nature of the case.

During the year 1,702 smallpox vaccinations were administered and 295 typhoid inoculations were made. In June 1,000 1-cubic-centimeter ampuls of typhoid-paratyphoid vaccine were received from the laboratory and distributed among practicing physicians.

*Control of venereal diseases.*—The service has assisted in the apprehension of women guilty or suspected of immorality. Practically all of those apprehended are examined by the service to determine whether or not they are venereally infected. Of the 54 examined, to the end of the fiscal year, 29 were found venereally infected and were sent for detention to a home maintained by the War Camp Community Service of Lawton. Women suffering from gonorrhea are released after two successive negative examinations, and those suffering from syphilis when there are no open visible lesions of the disease. Before release, they are required to sign a parole promising to lead a moral life, and an effort is made to place them in safe hands. Prophylactic treatment at a station maintained in Lawton by the military authorities is supervised by the service. Funds for building and maintaining an isolation hospital for venereal diseases have been assured.

*General sanitation.*—The necessary rules and regulations have been promulgated in regard to barber shops, rooming houses, etc.: col-

lection and disposal of garbage, refuse, rubbish, and stable manure; enforcing the installation of proper sewer connections, and similar matters. Inspections have been made to secure compliance.

#### EBERTS FIELD ZONE, LONOKE, ARK.

An extra-cantonment zone was established around Camp Eberts, an aviation field, in December, 1917, in cooperation with the State and local authorities and the Red Cross. The city of Lonoke is in the center of the zone.

*Malaria control.*—The drainage work necessary in this area comprised about 55 miles of ditching, of which 46.3 miles had been completed at the close of the fiscal year. A considerable portion of the ditching has been roadside ditching to care for the waste water from rice fields. Oiling of all water surfaces was begun on May 1 and continued at intervals of seven days or less. Breaks in the levees in the rice fields in many cases made more frequent applications of oil necessary. During May and June 3,195 gallons of oil were used, amounting probably to about 20 gallons per application per mile.

The laboratory of the extra-cantonment zone at Camp Pike has been used in making an endemic index of the residents of the Eberts Field zone. Two separate indices were made, that for January being 0.4 and for May 1.6. Field tests are in progress by which it is hoped to secure data concerning the reduction and possible control of mosquito breeding in rice fields.

*Rural sanitation.*—On request of the military authorities, assistance was rendered in the sanitation of areas within the limits of Eberts Field. The work accomplished offers an object lesson in preventive medicine and places this camp in the foremost rank of those giving health protection to their laboring population and to the surrounding community. When additions were made to the medical staff at the field, the service withdrew from work within the field limits.

*Control of milk supplies.*—Daily inspection is carried out at the one dairy within the extra-cantonment zone. There is no pasteurization.

*Control of food supplies.*—In addition to the supervision of food supplies for laborers within the limits of Eberts Field, inspections were made of 146 food and drink establishments (including barber shops) in Lonoke and 111 in England. Forty-seven places were graded in Lonoke and 34 in England. Sixty employees were examined and 10 eliminated in Lonoke, and 116 were examined and 8 eliminated in England. Sixty-five typhoid and 15 smallpox inoculations were made in the case of employees in Lonoke food establishments, and 116 typhoid and 49 smallpox inoculations in England.

*Medical inspection of schools.*—In England 409 school children and in Lonoke 435 school children were examined. Vaccination was successfully carried out in the case of 385 school children in England and 396 in Lonoke.

*Control of communicable diseases.*—In all 7,636 smallpox and 794 typhoid inoculations have been made.

*Control of venereal diseases.*—Seventy-seven cases of syphilis were found among the workmen at Eberts Field, although no consistent

efforts at examination of these men were made. All cases found were promptly isolated and transportation furnished to the clinic at Little Rock. Comparatively few of the cases reached the clinic, but they were eliminated as foci for the spread of the disease in the camp. Weekly reports of sales of drugs for venereal diseases are made by druggists, and these have been followed up with excellent results. Physicians in Lonoke County are regularly reporting their cases of venereal diseases and furthermore are making prompt returns in the case of those having ceased treatment before reaching the noninfective stage.

*General sanitation.*—Surveys of sanitary conditions were made in both Lonoke and England, and every effort made to improve the conditions found.

#### CAMP FUNSTON ZONE, MANHATTAN, KANS.

The extra-cantonment zone around Camp Funston comprises Geary and Riley Counties, Kans., including the towns of Manhattan, Junction City, Army City, and Ogden. The sanitation of Army City was under the control of the military authorities until May, 1918, when it was taken over by the service. Ogden, having practically refused to clean up, was placed in so-called "quarantine" against men in uniform. This condition still existed at the end of the fiscal year. Work in this zone was carried out in cooperation with State and local authorities and the Red Cross.

*Rural sanitation.*—During the fiscal year 55 wells and other local water supplies were inspected and 9 condemned.

*Control of milk supplies.*—A special effort was made to improve the condition of the milk supplied to the camp and to the towns in its vicinity. During the year 133 dairies were inspected, 353 visits were made to them, 10 creamery inspection visits were made, 16 ice-cream factory inspection visits were made, 1,213 cows were tested for tuberculosis (67 reacting), 625 samples of milk, 42 samples of ice cream, and 1 sample of cream were collected for analysis.

*Control of food supplies.*—During the year 3,363 restaurant inspections, 1,471 soda-fountain inspections, and 500 meat-market inspections were made; 27 restaurants were closed because of insanitary conditions.

*Medical inspection of schools.*—Medical inspection of school children was carried out in 45 schools. During the year 1,688 school children were examined, 2,112 physical defects being found. Notices were sent to parents in 685 cases.

*Public health nursing.*—In addition to work in the schools the following visits were made by the public health nurses during the year: Nine hundred and eight nursing visits, 4,857 instructive visits, 1,757 miscellaneous visits. In school and elsewhere, the nurses took 4,500 cultures for detection of meningitis.

*Laboratory.*—During the fiscal year 8,799 examinations were made at the laboratory established in connection with the zone work. Part of these were for the diagnosis of tuberculosis, diphtheria, typhoid fever, meningitis, gonorrhea, and syphilis. The others were bacteriological examinations of milk, ice cream, water, and meat.

*Control of communicable diseases.*—An effort was made to improve the morbidity reporting in this area. In addition, 6,500 inoculations against typhoid and 6,300 against smallpox were made during the fiscal year.

*Control of venereal diseases.*—In connection with the campaign to control venereal diseases, 54 infected persons were placed in quarantine at the State industrial farm.

*General sanitation.*—Emphasis was placed upon efforts to improve the general sanitary conditions in Manhattan. During the year 6,295 premises were inspected and 131 water connections and 904 sewer connections were made on request of the service.

#### GERSTNER FIELD ZONE, LAKE CHARLES, LA.

Operations in the Gerstner Field extra-contonment zone were commenced April 30, 1918. Malaria control is the only sanitary work undertaken by the service in this zone, other sanitary conditions being satisfactory. A full-time health officer is employed by Lake Charles and Calcasieu Parish.

*Malaria control.*—With the help of the local authorities, anti-mosquito measures were started without delay, the measures including oiling and ditching. By June 30 one-half of the initial work had been accomplished. There had been expended \$3,741, mostly by the local authorities.

The effect of the malaria-control work was very apparent. No new cases of malaria were contracted, the seven reported cases being either chronic or contracted elsewhere. No malaria has occurred at Gerstner Field.

#### CAMP GORDON ZONE, ATLANTA, GA.

The service took over the sanitation of the area surrounding Camp Gordon soon after the establishment of the camp in 1917. The zone is located in Fulton and Dekalb Counties, and the health work is being conducted in cooperation with the county and city health departments and the Red Cross. Atlanta, 8 miles from the camp, is a city of 200,000 population.

*Malaria control.*—Antimalaria work was started in Atlanta in August, 1917, and was extended to the 1-mile zone around Camp Gordon in September. For the work of the following spring it was decided to confine operations to a one-half-mile zone around the camp. When the camp boundaries were extended in March, 1918, a new half-mile zone was established. Later work was carried on also at Fort McPherson, Norcross Rifle Range, and in the city of Atlanta.

During the fiscal year work was carried on over an area of 44 square miles. 112 miles of brush were cut. 30 miles of ditches were dug. 180 miles of streams were cleaned, and 34 miles of streams were recleaned. Periodic oiling was also carried out. The population affected was estimated to be 282,800. The cost was \$46,572.28. The per capita cost in the different zones was: Camp Gordon, \$0.67; Norcross, \$1.15; Fort McPherson, \$0.31. In the city of Atlanta the per capita cost was \$0.05.

*Rural sanitation.*—Rural sanitation demonstration studies were conducted in Fulton and Dekalb Counties on a cooperative basis.

Work was commenced in Chamblee early in September, 1917. The building of privies of the double concrete-vault type was begun October 1, 1917, and continued, except for the winter months, until the end of the fiscal year.

Several small villages in the zone were made to clean up, install a good water supply, and arrange for sewage disposal. By the end of the fiscal year all of the rural-sanitation work had been completed in the 5-mile zone around Camp Gordon.

During the year 2,880 homes were canvassed and surveyed, 15 churches inspected, 18 railroad stations inspected, 39 public lectures given, 4,850 pamphlets distributed, 1,433 cement vaults built, 1,355 privy houses built, 121 old privy houses remodeled, and 1,058 seats built.

*Control of milk supplies.*—Pasteurizing plants in Atlanta have been renovated and in several instances new equipment installed. At the present time there are six such plants thoroughly equipped and in operation. These are capable of pasteurizing 5,000 gallons of milk daily. All certified restaurants and hotels are required to use pasteurized milk. A daily inspection is made of pasteurizing plants. Some work was done by the Red Cross dairy inspector and inspectors of the Dairy Division, Department of Agriculture, in an effort to introduce modern methods in the dairies surrounding Atlanta.

*Control of food supplies.*—Early in 1918 a survey was made of all the eating places in the city. Notices based on the survey were sent to each proprietor, and reinspections were made from time to time to induce the eating places to adopt sanitary measures. In spite of lack of authority to compel the adoption of such measures the eating places of Atlanta are now believed to be in very sanitary condition.

A survey was made of bakeries serving cantonments and certified restaurants. These were found to be in an insanitary condition. They have now been screened, places for wearing apparel installed, urinals and toilets removed from workrooms, and the personnel improved.

Inspections have also been made at intervals of grocery stores, ice-cream parlors, soft-drink founts, and meat-packing places. Of the 316 soft-drink establishments, 45 now have sterilizers, although an ordinance requiring sterilization was defeated by the city council. In the ice-cream parlors sterilization of spoons and saucers has been insisted on, and, where possible, paper saucers have been installed. Previous to service operations the condition in meat-packing establishments was insanitary in the extreme. It was not an unusual thing to find negro employees sitting on a pile of salt meat, chewing tobacco and spitting on the meat. Rodents and flies were innumerable. Valuable assistance was given by representatives of the Bureau of Animal Industry in the effort to improve these conditions. At the end of the fiscal year the meat-packing establishments were in a condition creditable to themselves and to the city of Atlanta.

*Medical inspection of schools.*—A complete inspection of the city schools of Atlanta and of the rural schools of Fulton and Dekalb Counties was made during March, 1918.

*Control of communicable diseases.*—In October, 1917, efforts to locate and control communicable diseases were begun. A Red Cross

nurse visited all the rural schools and looked after cases of diseases occurring in the zone.

During November, 1917, all the physicians in Atlanta were interviewed in an effort to get their cooperation in the matter of reporting disease. Early in 1918 the Atlanta Board of Health adopted the complete list of reportable diseases recommended by the American Public Health Association.

Cases of communicable diseases reported from the zone were immediately investigated to ascertain source of infection and exposures which resulted from the case, and also to give instructions to the family and attendants in regard to preventive measures.

A smallpox epidemic, which occurred in Dekalb County, was promptly suppressed by vaccination of 250 persons.

*Control of venereal diseases.*—Following a survey of the venereal situation in January and February, 1918, a clinic was established in Atlanta. Later a negro clinic and clinics at the city jail and at the Pinecrest Detention Home for Girls were established. In these clinics 2,305 persons were treated during the fiscal year, 17 were rendered noninfective, 383 Wassermann tests were made, and 1,004 doses of arsphenamine were given.

*General sanitation.*—Sanitary inspections were carried out systematically. Inspection of barber shops and similar places found them to be in good condition, owing to enforcement by the State of laws regulating establishments of this nature. Some which were not complying with the regulations were given warning that soldier trade would be excluded if they did not improve conditions.

#### CAMP GREENE ZONE, CHARLOTTE, N. C.

Work was begun in the extra-cantonment zone about Camp Greene early in September, 1917. Six organizations have been involved in the work—the State, county, and city health authorities, the Army medical department, the Red Cross, and the Public Health Service. The zone surrounding the camp, which is about 2 miles square and partly included in the city limits of Charlotte, covers this city and considerable rural territory.

*Malaria control.*—A zone half a mile wide immediately surrounding the camp has been adequately controlled against the breeding of mosquitoes. The work has consisted of drainage, filling, fencing, oiling, and introducing fish. The area of operation includes about 6 square miles. About 2,000 gallons of oil have been distributed.

*Rural sanitation.*—Rural sanitation demonstration work was conducted in the county. A zone varying in diameter from three-fourths to 2 miles wide, entirely surrounding the camp, has been provided with sanitary privies. Two hundred and twenty-nine farm homes have been provided with closets. The concrete type of vault, which has been used in nearly all places, has met with hearty approval.

*Sewage disposal in Charlotte.*—In Charlotte approximately 2,500 insanitary closets were abolished. It is estimated that at least 95 per cent of all homes formerly provided with open insanitary closets have been provided with sanitary ones. Connections have been compelled on existing sewer lines and new sewers have been constructed.

*Control of milk supplies.*—About 75 per cent of the city's milk supply was being pasteurized at the end of the fiscal year. More than 1,800 visits had been made to dairies supplying milk to the city.

*Control of food supplies.*—A system of placarding and approving restaurants, soda fountains, meat markets, hotels, and other places frequented by troops in Charlotte has been established and has brought good results. All restaurant employees have been required to present themselves for physical examination and a large number have been inoculated against typhoid fever. All of the restaurants and eating places which have sprung up in the zone outside of Charlotte have been inspected and provided with sewer connections or sanitary closets.

*Medical inspection of schools.*—Eleven schools in Charlotte and about 8,000 school children have been under observation. In the zone outside of Charlotte about 1,000 school children were vaccinated, and regular visits have been made to mill villages and schools.

*Public health nursing.*—Public health nursing work has been carried to every part of Charlotte and to some thickly settled districts outside the city limits. Many thousands of nursing, instructive, school, and follow-up visits have been made. Two baby-welfare stations have been developed.

*Laboratory.*—Daily examinations of city water and milk supplies and routine examinations of a clinical nature have been made at a laboratory recently established.

*Control of communicable diseases.*—It is believed that at present very accurate and full reports of diseases are being received from physicians. At the suggestion of the service the Charlotte commissioners passed very stringent quarantine regulations governing communicable diseases. Other ordinances, drafted by the service and the city health department, relate to manure, sewage, and garbage disposal; milk supply; open wells and springs; restaurants, hotels, etc.; and morbidity reporting.

Approximately 600 doses of antityphoid vaccine and 4,500 doses of smallpox vaccine have been administered in the city. A tuberculosis clinic has been established.

*Control of venereal diseases.*—A venereal-disease clinic was established in October, 1917. By the end of the fiscal year about 40 patients were being treated per day. A system of follow-up work has been carried out to secure new patients and hold old patients. Drug stores are required to record the name and address of all persons purchasing medicine for treatment of venereal diseases. Information as to the source of infection of Army cases has been furnished by the Army, and these "carriers" have been ordered to report to the clinic for treatment. There is authority for the quarantine of venereal diseases, and this has been enforced in some cases. Persons suffering with venereal diseases who are arrested for prostitution or other cause are placed under treatment at the county jail or workhouse. The War Department has detailed an officer for work in the zone, and he has closely cooperated with the service work.

#### CAMP HANCOCK ZONE, AUGUSTA, GA.

Camp Hancock is situated to the west and southwest of the city of Augusta, Ga., on a decided elevation. The extra-cantonment zone

lies in the city of Augusta, in Richmond County, Ga., and in a small section of South Carolina. The officer in charge of the extra-cantonment zone was appointed deputy State health officer in both Georgia and South Carolina, deputy health officer for Augusta, and deputy health officer for the county of Richmond. The Red Cross assisted in the work in this zone.

*Malaria control.*—Active drainage work was started by the service on January 8, 1918. During the fiscal year 90 miles of brush were cut, 91 miles of streams were cleaned, 43 miles of ditches were dug, 4 miles of the edges of ponds were cleaned, and 138 miles of work was finished. Review work was carried out where advisable. In addition, much work was undertaken where special problems of drainage or clearing arose. During the fiscal year 730 miles of streams were oiled and 3,508 gallons of oil used. The oiling cost \$12.45 per mile. Contemplated extensions of Camp Hancock will require the adoption of a new malaria-control zone and necessitate additional work, but much of the work done will be of advantage to the military authorities in preventing mosquito breeding in the camp as extended.

*Cooperation with Bureau of Fisheries.*—At the request of the service, studies on the fish control of mosquitoes were made in Augusta by the Bureau of Fisheries. The region was first surveyed to determine the species of fish present and the relative abundance of each. The top minnow was found nearly everywhere in ponds, ditches, and creeks located in open fields and pastures, but rarely in waters located in wooded areas. This fish was not abundant except in a few old brickyard ponds, and efforts were made to increase the supply in the following ways:

- (1) By asking fishermen not to use top minnows as bait.
- (2) By propagating the fish in certain ponds, removing their natural enemies, and introducing adult *Gambusia*. These ponds then furnished a handy supply of the fish.
- (3) By obtaining top minnows from outside the area under protection. About 50,000 fish were brought into the zone during the fiscal year.

A very encouraging increase in the supply of top minnows is everywhere noticeable.

In order to determine the value of fishes other than *Gambusia* as eradicators of mosquito larvæ, a pond containing no fish was stocked with sunfish of three or four different species, and another pond, containing no top minnows but other species, including the pigmy sunfish, is being kept under observation. This work indicates that fishes other than the top minnow are of limited value in connection with the mosquito problem.

*Rural sanitation.*—The city and county boards of health have adopted ordinances abolishing the surface privy, and requiring that those which could not be connected with sewers be made sanitary. The ordinance passed by the county permitted pit privies for temporary emergencies, where a special permit was secured. The ordinances went into effect in May, 1918, and by the end of the fiscal year 722 jasper boxes had been sold in the city and 111 in the county. It was found that the metal jasper boxes manufactured in Atlanta were cheaper than wooden boxes manufactured locally. In the county a number of L. R. S. privies have also been installed.



From one portion of Augusta soldiers were excluded entirely pending the installation of sanitary privies.

*Control of milk supplies.*—At the request of the service, an exhaustive study of the milk supply of Augusta and surrounding region was made by the Bureau of Animal Industry. Farm conditions were found to be good, the high percentage of barns and milk houses of sanitary construction being especially noteworthy. Every effort has been made by the service to carry out or have carried out the recommendations made as a result of the survey.

*Control of food supplies.*—Federal work in the control of food supplies commenced in December, 1917. At first the restaurants in bad sanitary condition were not closed, because that would have meant that the dirtiest cooks and waiters would have been scattered among the restaurants and hotels of the better class. Instead, certificates were issued to the latter as a safeguard to soldiers, and gradually the inspection was made more rigid. After a few weeks the worst restaurants were closed. In May the certificates were confined to places which scored 75 on the city card, served milk which had either been pasteurized or was grade A, and had no surface privy in the same block with the restaurant.

In the first six months of 1918, 12,629 inspections were made, 234 Federal certificates issued, 682 meat markets, restaurants, soda fountains, and dairy farms scored, and 323 notices served, and 1 conviction was secured in court. During the year from July 1, 1917, to June 30, 1918, 8,876 pounds of sausage, 5,134 pounds of liver, 3,799 pounds of beef, 5,885 pounds of fish, 3,088 pounds of weenies, and more than 5,000 pounds of other kinds of meat and poultry were condemned.

Assistance was given to a food demonstrator employed by Richmond County in cooperation with the State agricultural college and the United States Department of Agriculture.

*Medical inspection in stores, etc.*—A medical inspection of department-store employees at least weekly was carried out, and in several instances infectious cases were found in the early stage of disease and taken out of the stores. With the appearance of cases of infectious diseases in the personnel of the post office and the telephone exchange at Augusta, a daily medical inspection was immediately instituted, and this was later reduced to a weekly inspection. Finally an arrangement was made by which the service was notified if a person in either office was taken sick.

*Public health nursing.*—In the city, as soon as an infectious case is reported to the board of health, a public health nurse visits the patient's house, instructs the family as to the regulations in regard to isolation, and obtains the names of all civilians and soldiers who have come in contact with the case during the period of presumed infectivity. The names of the soldiers are immediately reported to the camp. In case of meningitis, contacts are taken to the laboratory for examination to see whether they are carriers.

A summary of the nursing work follows: Eight hundred and thirty-eight visits to schools, 52 visits to telephone exchange, 70 visits to stores, 872 instructive visits, 99 nursing visits, 377 cases investigated, assisted at vaccinations in 254 cases, 164 contagious diseases discovered by nurses, 58 hygiene talks given by nurses, 198 meningitis contacts taken to laboratory, etc.

*Laboratory.*—Laboratory work was conducted in the State medical college laboratory by a bacteriologist detailed to the Red Cross unit. In all, 1,403 examinations were made.

*Control of communicable diseases.*—The making of reports of disease has been found to be an increasing burden on local practitioners because of the number who had been called into Government service. The prompt securing of death certificates has been attended with greater difficulty than that of the daily morbidity reports.

Other features of the control of communicable diseases will be found under other headings.

*Control of venereal diseases.*—Both the city and the county boards of health adopted with slight amendment the venereal-disease ordinance recommended jointly by the Surgeons General of the Army, the Navy, and the Public Health Service.

At the clinics which were established, 228 patients were treated, 116 for syphilis, 10 for gonorrhea, and 2 for chancroid.

Convicted persons suffering from venereal disease were isolated until no longer infectious. Much of the venereal-control work was done in cooperation with the State board of health, which was carrying on a State-wide campaign.

*Educational measures.*—Much stress was laid upon an educational movement by means of public addresses, of which nearly 200 were delivered in churches, schools, stores, mills, clubs, and other places.

*General sanitation.*—On the basis of recommendations by the service following a study of the Augusta waterworks, a reserve chlorinating apparatus was purchased by the city, and the water was tested bacteriologically daily instead of once a week. Assistance was rendered during an emergency resulting from the breaking of an important water pipe, the entire inspecting force of the service, the Red Cross unit, and the city board of health being utilized.

#### CAMP JACKSON ZONE, COLUMBIA, S. C.

Extra-cantonment sanitation was undertaken by the service and the Red Cross in a zone surrounding Camp Jackson to assist State and local health authorities in the enforcement of health measures. The service officer was made a deputy State health officer.

*Malaria control.*—As Camp Jackson was practically surrounded by numerous marshy areas and tributary streams, the malaria problem was one of the most important encountered. Drainage and oiling operations were begun in the fall of 1917 in a zone 1 mile wide around the camp. A more complete organization was effected in March, 1918, by which the antimalaria operations in the city were taken over by the service. By the end of the fiscal year about one-half of the ditches in the area had been trained and drained and arrangements made for the oiling and spraying of streams. Fifty-three miles of ditching was completed in the malaria zone around the camp and 40 additional miles in the city of Columbia. Forty-four drip cans have been established in the malaria zone around the camp and 46 in the city of Columbia.

*Rural sanitation.*—An attempt has been made on a restricted scale to do rural sanitation work in the settlements outside of Columbia.

The population of this area is estimated at about 15,000. It is estimated that there are at present 2,000 surface toilets and an equal number of surface wells in the area. County assistance has not been secured for sanitating this region.

*Control of milk supplies.*—A special effort has been made to provide not only a clean but a safe milk supply. A number of pasteurization plants are now under construction by local dairymen, and when completed these will provide facilities for the pasteurization of all milk in Columbia. Grading of milk is now being carried out by the laboratory. Twenty-six dairies and 616 private cow dairies had been inspected up to the end of the fiscal year.

*Control of food supplies.*—An active campaign to improve sanitary conditions in food establishments has been carried on since March, 1918, when this work was taken over from the municipal authorities. Medical examinations are made of all employees in food depots. Up to the end of the fiscal year 266 food depots had been inspected, 351 had been reinspected, 153 temporary certificates had been issued, 5 slaughterhouses had been inspected, and 540 cows had been tested for tuberculosis, 3 reacting.

*Medical inspection of schools.*—During the fiscal year 68 schools were visited, 2,489 pupils were examined (of whom 1,931 were recommended for medical attention). 2,483 malaria specimens were obtained, 2,210 minor treatments were given by nurses, 955 follow-up visits were made, 1,052 notices were sent to parents, 83 health talks were given, 13 school buildings were inspected from a sanitary point of view, and 75 rooms were graded on personal hygiene. A school clinic has been placed in operation.

*Laboratory.*—A laboratory was organized shortly after the service took charge of the zone. It was of special use during an epidemic of cerebrospinal meningitis, during which about 30 cases occurred in Columbia and more than 250 in the State. The bacteriologist detailed to the laboratory by the Red Cross visited over 250 cases throughout the State, rendered assistance to local physicians, obtained spinal fluid for laboratory examination, made cultures, and in other ways assisted in this important emergency work. In all, examinations were made in the case of 4,203 suspected carriers and 68 suspected cases furnishing spinal fluid. A large amount of routine work was done in connection with the diagnosis of diphtheria, malaria, tuberculosis, gonorrhea, and typhoid fever, and the usual examinations were made of water and milk samples.

*Control of communicable diseases.*—Efforts have been made to secure efficient reporting of communicable diseases, but the service office in this zone has not had power to bring about satisfactory results in this direction. Assistance rendered by the laboratory in meeting the epidemic of meningitis is recorded above.

*Control of venereal diseases.*—Columbia, when the work started, was not provided with a city hospital and had no general clinic for the treatment of indigents. A free clinic for the treatment of venereal diseases was therefore established. At present a clinic in the city jail for the treatment of moral delinquents is being established. Legislation has been enacted by the State of South Carolina and by the city of Columbia providing the necessary legal machinery for venereal-disease control.

*General sanitation.*—Regulations were adopted by the State board of health covering the 5-mile zone, and included measures relating to milk and milk products, public food receptacles and utensils, public water supplies, disposal of human excreta, and sanitation of food depots. An active campaign has been carried out to enforce these regulations.

CAMP JOSEPH E. JOHNSTON ZONE, JACKSONVILLE, FLA.

The zone around Camp Joseph E. Johnston was established, with the assistance of the Red Cross, in February, 1918. The camp is for the training of Quartermaster troops, the number in training varying from 15,000 to 25,000. A large part of the sanitary work in this zone was left in the hands of local health authorities.

*Malaria control.*—The area of activities includes about  $7\frac{1}{2}$  square miles in the vicinity of the camp and about  $2\frac{1}{2}$  square miles in Jacksonville. The work in Jacksonville has been that of cleaning natural water courses and supervising drainage work which railroad companies are carrying out at the request of the service. A summary of the work around the camp follows: Brush cut, 32.1 miles; streams cleaned, 21.4 miles; ditches dug, 40.72 miles; filling, 188.5 cubic yards. Prior to beginning operations, mosquitoes were very numerous in all the swampy areas. Since the drainage work there has been a marked reduction in the numbers of mosquitoes, scarcely any being encountered in walking through the woods. No *Anopheles* have been found in the completed section for several weeks.

*Rural sanitation.*—Concrete vault privies have been constructed in the areas near the camp and a house-to-house survey in the rest of the zone has been made to stimulate citizens and State authorities to more efforts in the same line. As a result, besides the vaults constructed by the service hundreds of privies have been made sanitary by the owners. Premises have been carefully scrutinized and many persons who had allowed insanitary conditions to remain have been brought into court. Up to the end of the fiscal year 300 homes had been visited, 68 vaults constructed, 26 privies installed, 25 wells, etc., inspected, and 15 wells, etc., condemned.

*Control of milk supplies.*—Pasteurization is not required. The initiative of local health agencies, somewhat stimulated by the added need of precaution because of the presence of the camp, has resulted in maintaining a fairly safe milk supply.

*Control of food supplies.*—Most of the work in regard to the control of food supplies was left in the hands of the city health department.

*Medical inspection of schools.*—In addition to the medical inspection of school children conducted by the city health department, assistance was furnished, through the Red Cross, in the inspection of the 14 schools, colored and white, outside the city. A total of 869 physical examinations were made.

*Public-health nursing.*—The work outside the city of Jacksonville devolved upon nurses furnished by the Red Cross. During the fiscal year 692 home calls, 123 school calls, and 70 miscellaneous calls were made.

*Laboratory.*—The laboratory work for the zone has been furnished by the central State laboratory.

*Control of communicable diseases.*—Various means, more or less unsuccessful, have been undertaken to get better morbidity reports in the zone. The field nurses and State inspectors have been able to find missed or unreported cases through school and house work, permitting fairly good control of the communicable-disease situation. There have been no serious epidemics, but a small outbreak of meningitis in the camp was followed by one of similar size in the city.

*Control of venereal diseases.*—On May 15, 1918, a clinic was opened, and a separate one for colored patients was ready for operation by July 1. By June, through the aid of the law-enforcement division of the Committee on Training Camp Activities, Jacksonville had adopted an ordinance modeled after the regulations approved by the Surgeons General of the Army, Navy, and Public Health Service. Plans were laid whereby detention and treatment could be carried out in the case of all persons who are arrested for any offense. Other cases can be quarantined if the city health officer sees fit.

*General sanitation.*—Efforts have been made to improve sanitation in the seven or eight shipyards and numerous smaller plants making or assembling war materials. Each management was approached in a friendly way. It is hoped by the end of the summer to have completed a survey and to have all the employees inoculated against typhoid fever.

#### FORT LEAVENWORTH ZONE, LEAVENWORTH, KANS.

The extra-cantonment zone at Fort Leavenworth includes a 5-mile zone around the fort and the entire city, with a total population of about 30,000. The zone was established with the cooperation of the Red Cross on August 14, 1917. The service officer in charge was appointed city health officer and deputy State health officer.

*Typhoid-fever epidemic.*—The most pressing problem to be attacked when the zone was established was an epidemic of typhoid fever, as 18 to 26 cases were being reported weekly. The public was advised to boil all water and milk and a wholesale inoculation against typhoid fever was begun. After one week there was a considerable drop in the number of new cases of typhoid, and by October the epidemic was ended.

An epidemiological study placed the city water supply under grave suspicion. Some recommendations for improvements at the water plant have been made. By keeping a close watch over the plant the supply has been kept safe.

In September and October, 1917, a sanitary survey was made of all premises in the city, with special reference to the typhoid-fever epidemic. Five thousand inspections were made, 3,900 notices of condemnation served, 1,457 new privy vaults constructed and approved, 657 new privy buildings inspected and approved, 270 new sewer connections made, 327 old vaults filled and abandoned. As a result of service recommendations, 5 miles of new sewers were laid.

*Malaria control.*—Two cases of malaria and some breeding of Anopheles have been noted, but cleaning of streams will present no great difficulty.

*Rural sanitation.*—A sanitary survey has been made of Easton, a small incorporated town in the county, resulting in considerable clean-

ing up; but sanitary work of this kind has been centered in Leavenworth City.

*Control of milk supplies.*—A preliminary survey of the milk supply, made in connection with the typhoid-fever epidemic, found the supply to be in a very serious condition. A model milk ordinance was passed October 2, creating the office of milk inspector and regulating the sale and delivery of milk, cream, and other dairy products. Dairies and local milk depots are now inspected and scored according to the score card of the Bureau of Animal Industry. Routine samples of milk, cream, and ice cream are collected for chemical and bacteriological examination. Thorough enforcement of the ordinance has resulted in giving Leavenworth an excellent milk supply, with a low bacterial count. The chemical composition is up to standard except in the case of ice cream. During the year 449 dairies, creameries, etc., have been inspected, 301 samples of milk, cream, and ice cream collected and tested, 982 cows tested for tuberculosis, 26 being found diseased, and 7 complaints filed for noncompliance with the ordinance.

*Control of food supplies.*—Beginning in February a systematic and periodic inspection has been made of restaurants, ice-cream parlors, and confectioneries, and a physical examination has been made of all employees serving in these places. Soldiers are not allowed to enter places which do not have a permit from the service. Meat markets have been inspected. During the year 496 restaurants, ice-cream parlors, barber shops, etc., were inspected, and 161 physical examinations of employees made.

*Medical inspection of school children.*—Practically all school children in Leavenworth and the pupils of 39 schools outside the city were examined at the beginning of the school year. Those in 38 other rural schools had been previously examined by local authorities. School buildings were surveyed and improvements taken up with the local authorities. School nurses have followed up cases shown to need treatment. Two clinics were held in small towns for the removal of tonsils and adenoids. In Leavenworth arrangements have been made with local physicians and dentists for correcting defects of poor children.

The medical inspection of school children comprised the following: Five hundred and twenty-six visits to schools, 4,950 physical examinations of school children, of whom 3,912 had 9,016 physical defects, 1,673 reexaminations and interviews by nurses, 3,001 inspections for communicable diseases, etc.

*Public health nursing.*—Varied work has been done by the public health nurses. During the year 1,034 nursing visits and 6,810 visits to homes for investigation and instructions were made, 767 specimens and cultures were taken, and 846 visits were made for miscellaneous purposes. The work of the nurses has been chiefly along the lines of prevention of communicable diseases and actual bedside demonstrations of nursing in these diseases, but when time allowed they have given actual nursing services to the poor.

*Laboratory.*—Before the establishment of the service laboratory in the zone the laboratory car "Wyman" was used. Local physicians have made extensive use of the laboratory facilities offered by the service. During the year 2,176 examinations were made.

*Control of communicable diseases.*—All contagious diseases occurring in Leavenworth are required to be reported immediately to the service offices by telephone and by cards. The house is then placarded. Cases occurring in the county are reported to the county health officer, who reports to the service.

On the appearance of smallpox in Leavenworth in the fall 94 per cent of the school children were vaccinated. During the year 4,383 smallpox vaccinations were administered. Antityphoid inoculations, given in connection with the typhoid-fever epidemic, were as follows: First, 6,232; second, 5,749; third, 5,232.

*Control of venereal diseases.*—Under the regulations of the State board of health, the service is empowered to quarantine persons suffering from venereal diseases. All prostitutes arrested are turned over to the service for examination, and if they have venereal disease are held at the State industrial farm, located within the zone. The service has assisted in the treatments given at this farm, at which on June 30, 130 women were being held for venereal-disease infections.

Plans for a clinic have been completed, and it was expected to be in operation early in July.

*General sanitation.*—This subject has been treated at length under the typhoid-fever epidemic. In addition to the work there reported, barber shops and amusement places have been inspected periodically and a physical examination has been made of all employees. An ordinance covering manure disposal was passed by the city last fall and special attention is now being given to fly-breeding places.

#### CAMP LEE ZONE, PETERSBURG, VA.

Camp Lee is located in Prince George County, Va., about 3 miles east of Petersburg. The extra-cantonment zone includes the cities of Petersburg and Hopewell, the unincorporated villages of the Du Pont Powder Co., and Ettricks, and portions of the counties of Prince George, Chesterfield, and Dinwiddie. Sanitary work was carried out in cooperation with the State and local health authorities, and the Red Cross.

*Malaria control.*—Extensive mosquito-eradication measures were carried out in the areas nearest Camp Lee and the Du Pont Co. plants. The total work accomplished to June 30, 1918, included the digging of 44,765 yards of new ditches, the clearing of 55,182 yards of old ditches, and the filling of 386 depressions.

*Rural sanitation.*—A survey of the zone around Camp Lee was begun on July 24, 1917. A total of 815 homes were visited in the rural sections, sanitary conditions being ascertained and the occupants told how to put their premises into satisfactory condition. In August active work was begun on the construction of sanitary privies. The total number of concrete-vault toilets completed by the end of the fiscal year was 564, and the total number of sanitary boxes and cans installed was 1,886.

*Control of milk supplies.*—All the dairies supplying milk to Petersburg are under a rigid inspection. Bacteriological counts of the milk of each dairy are made twice each month. Seventy-five per cent of the supply is pasteurized by a private company. All of the

milk supplied to Hopewell is pasteurized, and the dairies supplying it are under inspection by the city and State health authorities, while the milk is analyzed frequently at the laboratory of the Du Pont Co.

In 1917 a thorough investigation of the milk supply of Petersburg was undertaken by a service expert and recommendations made for improving its sanitary quality.

*Control of food supplies.*—Certificates are issued to food establishments following inspections made by the service. Places without certificates are not permitted the patronage of soldiers. When a certificate is removed because of failure to comply with the regulations, it is not replaced for at least one week. During the year 35 restaurants were inspected and 12 were temporarily closed, 88 soda fountains were inspected, and 2 meat markets were inspected. No meat not passed by Government meat inspectors is allowed to be sold for use at Camp Lee.

*Medical inspection of schools.*—During the year, 1,906 school children were examined, of whom 955 were found to have marked defects. One hundred and two vaccinations were carried out.

*Public health nursing.*—The following work in public health nursing was accomplished. One thousand seven hundred and ninety instructive and investigative visits were made, 469 cases of communicable disease visited, and 46 school talks given.

*Control of communicable diseases.*—Efforts have been made to improve the reporting of communicable diseases in this area. In addition a systematic antityphoid inoculation campaign has been conducted. The service inoculated 936 persons (only 287 taking the three inoculations) and 4,700 (1,410, three inoculations) were inoculated by all agencies. Nine hundred and one were vaccinated by all agencies against smallpox.

*Control of venereal disease.*—A clinic was established by the service, and has had all of the patients which could be cared for by the force. Drastic venereal control rules and regulations have been passed by the State board of health and went into effect on June 1. These will enable the service to exercise more active control over venereal disease.

#### CAMP LEWIS ZONE, TACOMA, WASH.

Extra-cantonment zone sanitation at Camp Lewis, Wash., was begun on October 1, 1917. Camp Lewis is 17 miles south of Tacoma and is in the center of a Government reserve which, when entirely acquired from Pierce County, will comprise 70,000 acres, or 100 square miles. The officer in charge serves as deputy State commissioner of health, deputy county commissioner of health, and adviser to the health department of Tacoma. Cooperation was also given by the Red Cross.

*Rural sanitation.*—A house-to-house canvass has been made throughout the zones, and stores, pleasure resorts, restaurants, and soft-drink parlors in towns and villages scattered throughout the zone have been inspected. Water supply was thoroughly looked into, and contaminated wells were posted. Particular attention was paid to the abatement of all fly nuisances by fly proofing privies and by seeing that all excreta disposal, both human and animal, was sanitary and efficient. All cases of infectious diseases as they occurred



have been investigated and epidemiological data obtained. It was found that constant supervision of the zone would be required to keep it in a sanitary condition.

*Control of milk supplies.*—Inspection of dairies in Tacoma showed that production and handling of milk in the city was open to severe criticism in many particulars. After the inspection each dairy was furnished with a copy of the inspection notes and recommendations for necessary improvements. Most of the dairies responded and endeavored to comply. The inspections were extended to Olympia, and the Bureau of Animal Industry cooperated in the control work. On April 27 this agency withdrew its representative, and the Army assumed control of milk supplies in the zone. At the end of the fiscal year conditions were far from perfect in both Tacoma and Olympia. There are more than 100 one or two cow dairies selling milk in Tacoma in the raw state, without any inspection of the cows or conditions under which the milk is produced.

*Control of food supplies.*—Safeguarding the health of the soldiers in Tacoma and Olympia constituted a large part of the service work in this area. The Army issued an order forbidding soldiers to patronize restaurants, etc., which had not been certified by the service. Special sanitary regulations were drawn up and put in force, and a corps of inspectors was placed in the field. Two certificates were used, a white one for establishments complying with all service regulations, and a pink one for establishments which were considered safe from a sanitary point of view for soldiers to patronize, but which did not comply with all service regulations. Thousands of dollars have been spent by owners in necessary sanitary renovations. Later this sanitary work was extended to all food establishments in the zone. Health certificates were required of all food handlers. The possession of a Public Health Service certificate has come to be recognized in Tacoma and Olympia as a necessity to insure the success of any business which caters to the Army.

*Medical inspection of schools.*—There are 21 schools in the zone, with a school population of 1,000. The largest school has 135 pupils. Since there had been no previous inspections of school children, each one was examined, the defects noted on cards, and notices sent to the parent or guardian. During the school year 155 children had tonsillectomy and dental care. During the year 425 visits were made to the different schools, talks given to the pupils on personal hygiene, and examination made for contagious diseases of all kinds. At one school a course in home nursing was given. Absentees from school were followed up and many were found to be suffering from contagious diseases of different kinds. Two hundred and eight children were vaccinated in school.

*Public-health nursing.*—The work of the public-health nurses started on October 18, 1917. At the time there were 9 known cases of smallpox. All contacts were followed up and many additional cases were found and placed in strict quarantine. In connection with the school inspections, 1,127 visits were made to the homes and the cooperation of parents sought in helping the children live up to the rules laid down regarding personal hygiene. Literature in regard to the better care of babies was distributed. Since the closing of schools the homes have been visited at regular intervals.

Thirteen cases of tuberculosis have been under the supervision of the nurses.

*Laboratory.*—No laboratory was organized by the service as there were available the laboratories of the State department of health (Seattle) and the base hospital at Camp Lewis. The Tacoma health department has most of its laboratory work done at the general hospital laboratory, an arrangement which has hampered the service in the diagnosis of disease.

*Control of communicable diseases.*—Cooperative morbidity reporting was considered one of the first and most essential things to be accomplished in order to control contagious diseases in the extracantonment zone. Every effort was therefore made to improve reporting, and by the end of the fiscal year an effective system had been established over a very wide area of country. A system of following up absent pupils has been of inestimable value in locating cases of communicable disease.

Under pressure from the service and following the outbreak of an epidemic of scarlet fever in Tacoma, that city reorganized its health department and appointed a full-time health officer and a diagnosing physician. In other ways the service has exerted a marked influence for the better control of communicable diseases in Tacoma and Olympia.

Numerous cases of tuberculosis located by the public-health nurse have been moved to a sanitarium in Pierce County, located in the zone, south of Tacoma. Others have been sent to the clinic in Tacoma for examination and treatment. Still others have been treated in their homes.

*Control of venereal diseases.*—The venereal-disease control work in Tacoma began very soon after the establishment of the station. As an emergency measure the city passed an ordinance which required, among other things, the reporting of these diseases by number. Effort was made to apprehend infected women through the morals squad of the police force and detain them until cured. The city built an isolation hospital at which about 50 can be accommodated. The Army established a prophylactic station on the municipal dock. During routine inspections of hotels, lodging houses, eating establishments, etc., many infected persons were apprehended and detained for treatment.

Besides the local work, the officer in charge of the zone has organized State-wide work in Oregon, Washington, and Montana. In Seattle the same system of apprehension and detention of venereally infected persons was carried out, under an emergency ordinance similar to that adopted in Tacoma.

*General sanitation.*—Under food supplies is outlined the general plan of sanitary inspections carried out in this zone. These were made also in the case of barber shops and similar places, and soldiers were prohibited by Army authorities from visiting places not having service certificates.

A survey was made of water supplies throughout the zone. It was found that the watershed from which Tacoma receives its water supply was not adequately supervised. In January, 1918, the main sewer leading from a sawmill town on the watershed was washed out, and the water supply of Tacoma was heavily polluted. On rec-

ommendation of the service, an emergency hypochlorite plant to supplement the existing chlorination plant was installed.

Special attention was given to improving methods of excreta disposal throughout the zone. At the suggestion of the service, a system of sanitary can privies was installed at Roy.

#### CAMP LOGAN ZONE, HOUSTON, TEX.

The Camp Logan extra-cantonment zone includes all of Harris County, including the city of Houston with a population of 150,000. The total population of the zone is about 200,000. In addition to Camp Logan, the eastern boundaries of which are 1 mile from the Houston city limits, there is an aviation training station, Ellington Field, 16 miles southeast of the city. Certain antimosquito measures have been planned for this station. Work was carried out in cooperation with the State and local health authorities and the Red Cross.

*Malaria control.*—Measures for the eradication of mosquito-breeding places near Camp Logan have been in progress since March 25. Such work, as was done up to the close of the fiscal year, appears to have yielded good results.

*Rural sanitation.*—In the rural sanitation work assistance has been rendered by the International Health Board as well as by the State and county health authorities. A sanitary-privy campaign has been inaugurated in the vicinity of the camp, and by the end of the fiscal year a large number of sanitary privies of the dry-earth cement-vault type had been installed.

*Control of milk supplies.*—Milk and milk products, which are satisfactory from a sanitary point of view, are certified and certification cards are displayed. At the present time physical examinations of employees are made by private physicians.

*Control of food supplies.*—Inspection and certification of eating places, etc., was commenced in December, 1917. A very considerable improvement in sanitary conditions has been brought about. Provost guards are used to prevent soldiers from eating in uncertified places. A medical certificate, furnished by private physicians, has been required from all employees.

*Public-health nursing.*—A cooperative plan was effected for using the various nursing organizations of Houston as well as the service and the Red Cross. A great deal of work was accomplished by the end of the fiscal year.

*Laboratory.*—A fairly well-equipped laboratory, ample for the usual bacteriological, chemical, and diagnostic work, required at the station, was established.

*Control of venereal diseases.*—A clinic was established on February 8. More than half of the cases treated are voluntary, the others coming from local courts, the committee on the protection of girls, and the city dispensary. Only a few cases of venereal diseases have been reported by physicians.

#### CAMP MACARTHUR ZONE, WACO, TEX.

An extra-cantonment zone was established around Camp MacArthur, near Waco, Tex., in October, 1917, in cooperation with the

State and county health authorities, the Waco Chamber of Commerce, and the Red Cross. Sanitary work in the zone has to the greatest extent possible been featured through the Health Department, the intention being to secure support for the department so that it might continue on a well-established basis when the zone work ceases.

*Malaria control.*—Owing to unusual drought conditions malaria has not thus far been a problem in this zone. Ditching to the extent of 14,340 feet was carried out, and 340 gallons of oil were applied to streams and pools of a total length of 97,500 feet.

*Rural sanitation.*—Rural sanitation demonstration work was carried out with the aid of McLennan County. Rural surveys were conducted only in the 5-mile zone, and construction work was begun as soon as some of the homes had been surveyed. At homes where insanitary privies had been found requests were made of property owners to supply the material necessary for the installation of the concrete type privy under agreement that construction would be carried out by labor employed from service and county funds. The cooperation of property owners as a whole was exceptionally good. About 800 vaults will be constructed during the season from the funds available at the end of the fiscal year. It is believed that there are about 900 or 1,000 homes in the rural sections of the 5-mile zone.

*Control of milk supplies.*—Satisfactory improvement in milk supplies has been secured, although the problem was not completely solved by the end of the fiscal year. It has been impracticable to enforce pasteurization, and inspections in the producing area have therefore been resorted to as the system under which the best results could be obtained. Regulations prescribing conditions under which dairymen would be permitted to dispose of their products to establishments catering to soldiers were drawn up, and at the end of the fiscal year virtually all of the requirements were being complied with. The Bureau of Animal Industry of the United States Department of Agriculture gave valuable assistance in placing dairy control on a definite and consistent basis. Tuberculin testing was undertaken in April by the Bureau of Animal Industry. There are but two large ice-cream manufacturers in Waco, and the methods of both have been carefully examined. The ice cream from one of these concerns was excluded from Camp MacArthur by reason of insanitary conditions in the plant, and as a result this concern erected an entirely new plant, with practically an entire new equipment.

*Control of food supplies.*—Inspection and certification of establishments catering to soldiers has been continuous since the inauguration of extra-cantonment operations and very satisfactory results have been obtained. Fifty-two restaurants, 80 soda fountains and ice-cream parlors, 12 candy and pie factories and bakeries have been under control. In addition many miscellaneous establishments immediately surrounding Camp MacArthur have been regularly inspected and certified. In general the frequency of inspections of food establishments in Waco and close to the camp has depended upon the number of soldiers served.

*Medical inspection of schools.*—This work was organized early in January. By the end of the fiscal year 6,415 children has been examined and cards in regard to their physical condition filled out. The total enrollment in the zone is 8,131, of which 1,386 were in the

high school in Waco and were not examined. Following the first tabulations the medical inspector carried out a more intensive physical examination, with the result that 3,282 physical defects were found among 4,741 children examined. During the year 594 vaccinations were performed in four colored schools to effect complete protection of colored school children. Some vaccinations were performed in the white schools, but more than nine-tenths of the school children in the zone had already been successfully vaccinated.

*Public-health nursing.*—In addition to work in connection with the medical inspection of schools, the nurses have been engaged in public-health visits to cases of communicable disease, the collection of epidemiological data thereon, and infant-welfare work. From December 1 to the end of the fiscal year 2,553 visits were made in the homes of 534 patients, 942 of which were nursing and 1,611 instructive visits. These figures do not include visits to homes incident to medical inspection of schools, which totaled 1,258. Additional work has included talks on hygiene and allied topics to the public, to mothers, and to school children. In coordination with several local social agencies, an infant-welfare movement is being inaugurated.

*Laboratory.*—By the end of the fiscal year 2,001 examinations were made at a laboratory furnished by the city.

*Control of communicable diseases.*—Before the service took charge in this zone, notification of diseases was very perfunctory. A very noticeable increase in more reliable reporting was noted within 30 days after the service procedure for securing better morbidity reports was put into effect. By the end of the fiscal year notifications had come to be regarded as fairly representative of actual disease incidence. The minor communicable diseases are not adequately reported. Measures for the control of communicable disease had not received much attention in this zone prior to the service work. Beginning about December 1, 1917, all cases of the more severe communicable diseases were visited, diagnosis confirmed either clinically or by laboratory examination, and such measures instituted as were necessary to prevent further spread.

*Control of venereal diseases.*—By the end of the fiscal year a clinic and a detention hospital for the treatment of venereal infections were being equipped.

*General sanitation.*—Sanitary inspections in regard to barber shops, hotels, etc., were made during the year, 47 barber shops, 26 hotels, 10 theaters and moving-picture houses, and 5 swimming pools being under regular inspection. Other general sanitary work includes work in water control, assistance rendered Waco in forwarding a movement for a sewage-disposal plant, and the promulgation and placing in operation of ordinances intended to effect sanitary improvement within the city.

#### CAMP M'CLELLAN ZONE, ANNISTON, ALA.

Service operations were commenced in Anniston in August, 1917, in cooperation with State and local health officials and the Red Cross. The officer in charge was appointed as assistant to the Calhoun County and Anniston city health officers.

The area of Camp McClellan is about 31 square miles and sanitary work has been emphasized within a 5-mile zone around the

camp, the boundaries, including Anniston (22,000 population), Jacksonville (3,000), Oxford (2,000), Blue Mountain (1,000), and Hobson City (600). The zone comprises an area of about 210 square miles.

*Malaria control.*—Malaria-control work was begun in August, 1917, and with a few weeks' intermission during the winter, continued through the fiscal year. Anophelines were found breeding profusely in practically all the zone when the work was started.

At the end of the year about 50 square miles were under control, and about 120 miles of streams and ditches were being oiled periodically. During the fiscal year 7,015 gallons of mosquito oil were distributed. The average number of drip stations in operation were 66 and the average number of oilers engaged 10. During the year 176 miles of ditching and similar work was performed. Mosquito breeding is being controlled in numerous small ponds by the use of top-feeding minnows. Regular inspections for breeding are conducted over this area.

*Rural sanitation.*—Intensive work in rural sanitation was confined to the rural homes in the 5-mile zone around the camp and the towns of Jacksonville, Piedmont, Oxford, and Hobson City. Sanitary surveys were made of 5,871 homes, 64 schools, 157 stores, 39 churches, and 14 depots.

In practically all of the rural homes insanitary methods of excreta disposal were employed. In the rural districts nearly 300 double-compartment concrete vaults and 32 septic tanks have been built. At the close of the fiscal year in Anniston construction was nearly completed of 1½ miles of trunk sewer, which will accommodate four of the large industrial plants and a large number of homes. Ordinances were passed governing excreta disposal in Anniston, Jacksonville, Piedmont, and Hobson City.

*Control of milk supplies.*—A survey of the dairy farms and laboratory analyses of milk showed that Anniston was being furnished with a very unsafe supply. Dairy inspections and laboratory control were, therefore, started. All dairy cattle were tuberculin tested, those reacting being slaughtered or isolated. Efforts have been made to secure a central pasteurizing plant, and at the end of the fiscal year a pasteurizing ordinance had been passed, funds had been subscribed, milk producers had signed contracts to deliver to the plant, and plans of construction were under consideration.

An ordinance has been passed and enforced requiring the pasteurization of cream used in making ice cream.

*Control of food supplies.*—An ordinance has been passed providing for the inspection and scoring of public eating places, meat markets, etc. Certificates of approval have been issued by the service to places deserving of patronage by the military forces. About 800 food handlers have been examined physically and given small-pox and antityphoid vaccination.

Provision has been made for local meat inspection by the passage of an ordinance and the establishment of a central abattoir. The city has employed a full-time meat and milk inspector.

Soda dispensaries have been required to provide for adequate sterilization of glasses and utensils, or to use paper cups.

*Medical inspection of schools.*—Daily visits were made to schools in Anniston to detect children suffering from or exposed to com-

municable diseases. At the suggestion of the service, appropriate regulations covering the attendance of school children were issued by the school board. Children were vaccinated in cases in which this course was advised. Careful physical examinations were made of about 500 school children, and a high percentage were found to have physical defects needing correction. A free clinic has been established.

*Public health nursing.*—A staff of three nurses has been engaged in visiting all cases of communicable disease. They have assisted in the maintenance of isolation and in vaccinations, and have given instruction in methods of preventing the spread of contagion.

*Laboratory.*—A total of nearly 3,000 specimens have been examined in the laboratory, including routine bacteriological examinations of water, milk, ice cream, and specimens of blood, feces, sputum, etc.

*Control of communicable diseases.*—All cases of reported disease have been visited to secure epidemiological data and to enforce isolation. About 15,000 persons have been vaccinated against small-pox, and about 1,200 given antityphoid inoculation. Regulations prepared by the service for the control of communicable diseases were adopted by the county board of health.

*Control of venereal diseases.*—A venereal-disease clinic was established near the close of the year.

*General sanitation.*—During the first weeks of the year a house-to-house survey was made in Anniston. House-to-house stable inspection has been maintained throughout the year. At the suggestion of the service, an incinerator has been installed. As a result of an inspection of theaters, regulations were issued governing their ventilation. Barber shops have been inspected and regulations enforced in regard to their conduct.

On recommendation of the service, orders have been issued by the State health department for the immediate installation of a chlorinating apparatus in Anniston. An emergency hypochlorite plant has been installed in Jacksonville, and a chlorinating apparatus has been installed at the amusement park at Oxford Lake. In Anniston the water from 600 wells was examined and 119 wells were ordered closed where water connections were possible.

#### CAMP MEADE ZONE, ADMIRAL, MD.

Through an arrangement with the State board of health, the service undertook only malaria-control work in the extra-cantonment zone around Camp Meade.

*Malaria control.*—The territory to be covered by antimalaria measures comprised an area of approximately 20 square miles, the terrain being considered somewhat difficult of treatment on account of flatness and the fact that at least 65 per cent of the swampy land was wooded. Actual operations were commenced on May 2, 1918.

The chief remedial measure employed was ditching, which was supplemented by the draining and clearing of ponds and streams and by filling. In several instances where it appeared inadvisable to drain ponds used for commercial purposes, such ponds were lowered and the edges given careful attention throughout the breeding season.

Considerable success was attained, at relatively slight expense, in the drainage of certain swamps long notorious as breeding places of mosquitoes, notably at Odenton. The absence of mosquitoes was commented upon by residents of the vicinity.

The work accomplished up to the end of the fiscal year may be summarized as follows: Twenty-eight thousand feet of seepage ditches dug, 4,000 feet of pond edges cleaned, 22,400 feet of stream channels cleaned, 2,800 feet of new stream channels cut, 7,300 feet of old ditches trimmed and deepened, 2,450 feet of large drainage ditches dug, 500 feet of 24-inch tile drain cleaned, and 600 square feet of filling 1 foot in depth.

#### CAMP MERRITT ZONE, ENGLEWOOD, N. J.

The service assumed charge of the extra-cantonment zone at Camp Merritt in February, 1918. The zone includes the following boroughs: Englewood, Tenafly, Cresskill, Demarest, Closter, Hawthorn, Dumont, and Bergenfield. Much of the sanitary work has been left entirely in the hands of the local boards of health of these boroughs.

*Malaria control.*—Antimalaria work was carried out with the help of the Army authorities. Aside from the work of the latter, approximately 55,800 feet of ditches had been dug and cleaned. So effective has the malaria-control work been that the whole zone has been practically free from all mosquitoes, including those which do not convey malaria.

*Rural sanitation.*—By October 1 it is believed that all of the privies in close proximity to the camp will be sanitary. At the end of the fiscal year 15 modified L. R. S. privies and 171 double-compartment concrete vaults had been installed.

*Control of food supplies.*—By the end of the fiscal year all places dispensing food in the zone were being inspected once a week. Those found to be in sanitary condition are given certificates. The willingness of the proprietors to comply with the regulations which have been formulated was practically unanimous.

#### MISSISSIPPI COASTAL DISTRICT, GULFPORT, MISS.

In cooperation with State and local health authorities, a sanitary zone, which at present extends from Pass Christian to Pascagoula, was established in Mississippi and controlled from offices in Gulfport. The population in the area is estimated to be about 43,000. Work in the Mississippi coastal district has related chiefly to the prevention of malaria.

*Malaria control.*—About 22 of the 27 square miles in the western portion of the zone were under control at the end of the fiscal year. The eastern area covers about 15 square miles in which, by the end of the fiscal year antimalaria operations had not reached a point at which the area could be said to be under control. The extent of drainage work required in the western area was estimated to be 1,100,000 feet of ditches of all kinds. Of this, 513,000 feet, or 46.6 per cent, was completed by the end of the fiscal year. The cost per foot varied from 7 cents to 20 cents.



In June the district was divided into 10 unit zones, 7 of which required oiling operations. The total number of acres being oiled amounted to 12,353. The cost of oiling per acre per application has been about 6.2 cents. About one-fifth of a gallon of oil was used per acre per application. The season has been comparatively dry.

In June a systematic inspection of all premises was begun with the primary object of discovering and eliminating all mosquito-breeding places on private property. Only a small number of such breeding places was found.

*Rural sanitation.*—In the course of the inspection of premises for mosquito-breeding places, an astonishing number of insanitary privies were found. At the end of the fiscal year a sanitary-privy campaign was being inaugurated.

*Control of communicable diseases.*—As a result of service efforts, there has been a great increase in morbidity reporting and it is believed that the percentage of completeness is now high. Card-index boxes have been prepared for each of the 40 practicing physicians in the district, with divisions for each disease. Cases are recorded each day.

The high number of typhoid-fever cases made it advisable to carry on an extensive antityphoid vaccination campaign, which was started near the end of the fiscal year.

#### MUSCLE SHOALS SANITARY DISTRICT, FLORENCE, ALA.

The Muscle Shoals sanitary district, established in March, 1918, is situated in the northwestern corner of Alabama and occupies an area of 90 square miles. The essential reason for the conduct of operations in this district lay in the fact that the Ordnance Department of the Army was rushing to completion two large nitrate plants for the manufacture of explosives. In addition the Engineering Corps of the Army was building a large dam across the Tennessee River for the purpose of securing hydroelectric power. Sanitary work was carried out in cooperation with State and local health authorities, and the officer in charge given local status.

*Malaria control.*—No problem in this zone was more serious than that of malaria. A high rate of prevalence had been usual, and excellent breeding places for mosquitoes were found. Extensive drainage work and oiling were carried out. Up to June 30, 1918, 22½ miles of ditching had been done, but a great deal of work, such as driving sink holes to drain ponds, can not be estimated numerically. At the end of the year the drainage work was about 45 per cent completed. Oiling is being resorted to until draining can be carried out.

Frequent comments are made by residents on the absence of mosquitoes since the service work was begun. All indications are that the disease has been markedly reduced.

*Rural sanitation.*—The work in rural sanitation has been mainly investigative and educational. Where insanitary conditions were found to exist, correction was insisted upon. With the great influx of new residents, living accommodations were overtaxed and a great many tent communities were established. At each tent the following were required: (1) Sanitary privy; (2) complete screening with 16 to the inch mesh screening; (3) proper flooring; (4) garbage can;

and (5) general cleanliness. In certain localities burying of the excreta was permitted; in other, disposal into the Tennessee River was the method adopted. From March 16 to June 30, it is estimated that 500 sanitary privies were installed in the rural districts. Attention was given also to water supplies and unsafe supplies were placarded or the wells were filled.

*Control of milk supplies.*—A preliminary survey disclosed the fact that the most primitive methods were in vogue in the production and handling of milk. To improve conditions steps were taken for the eradication of tuberculosis among cattle. Up to the end of the fiscal year 560 cows were tested. Educational measures were employed to improve sanitary conditions with regard to the milk supply. Home pasteurization has been advocated. Drastic action was taken to improve the ice-cream supply.

*Control of food supplies.*—A preliminary survey showing great need for regulations to govern the production and sale of food—these were drawn up, conferences held with proprietors, and a campaign inaugurated for the immediate cleaning up of those places in operation. The regulations were adopted as ordinances by the commissioners of the different municipalities. An almost instantaneous improvement in food conditions was noted. A few establishments, unable to comply with the regulations, voluntarily closed their doors. Systematic inspections of food establishments were commenced on May 26, the day after that on which the regulations went into effect. Thirty-three food establishments were closed, all of which made satisfactory improvements within 10 days after ordered to close. Up to the end of the fiscal year 200 notices were served. Prosecution was brought against two parties for violation of the regulations.

Conditions surrounding the production, handling, and sale of foodstuffs in the Muscle Shoals sanitary district showed remarkable improvement following the commencement of service operations. This was due in great part to cooperation on the part of residents and the proprietors themselves.

*Medical inspection of schools.*—Medical inspection of school children was confined to an effort to prevent outbreaks of communicable disease in the schools. Stations were instituted to complete the vaccination against smallpox of all school children. A rapid survey was made of all schools in an effort to discover in its incipency any communicable disease which might exist among the children. A careful watch was kept upon contacts, who were in most cases eliminated from school during the period of incubation of the disease to which they had been exposed.

*Public-health nursing.*—Public-health nursing was commenced in April, one nurse being detailed to each of the three towns, Florence, Sheffield, and Tuseumbia. Up to the end of the fiscal year, 717 visits were made by the nurses.

*Laboratory.*—A bacteriological laboratory was established in the courthouse of Lauderdale County in May. A total of 392 specimens was examined up to the end of the fiscal year.

*Control of communicable diseases.*—An investigation into morbidity reports in this zone showed that such data as had been kept was practically worthless as a record of disease prevalence. Not being in the registration area, many of the physicians were not accustomed to reporting diseases and felt that to do so was almost a violation of con-

fidential information. On two occasions in Florence it was necessary to prosecute physicians for failing to report. Convictions were obtained in both cases.

*Control of venereal diseases.*—Due restrictions applying to prostitution in extra cantonment areas have not been extended to apply to war industries areas, and the absence of military police makes it difficult to control prostitution. Because of the excessive demands of other phases of the sanitary program, no systematic procedure has been adopted by the control of venereal diseases.

*General sanitation.*—At present housing facilities in this district are totally inadequate to meet the need, and will present a problem when cold weather will retard proper ventilation and force persons now living in tent colonies to take other quarters. The danger from such diseases as pneumonia, meningitis, and smallpox will be intense. The service has encouraged every effort to secure more adequate housing conditions.

Surveys of water supplies showed that of Sheffield, Tuscumbia, and Plant No. 1 to be very unsatisfactory in quality. A temporary apparatus for disinfecting the water with hypochlorite-of-lime solution was installed on recommendation of the service, and arrangements are being completed to put in a more satisfactory disinfecting plant and to increase the efficiency of filtration. Recommendations were made in regard to the other water supplies in the district.

It was found that one of the most pressing sanitary problems in the district was the abolishment of the insanitary privy. To this end necessary ordinances were passed by the various city councils. Up to the end of the fiscal year sanitary privies had been constructed as follows: Florence, 1,036; Sheffield, 1,065; Tuscumbia, 665; total, 2,766. Sewer systems are being extended wherever practicable.

An effective ordinance, requiring garbage cans and insuring the proper collection of garbage, has been passed in Sheffield, and the city has contracted for an incinerator. Regulations in regard to the disposal of manure have been enforced, resulting in much less fly breeding.

By means of motion-picture slides, posters, handbills, public lectures, educational pamphlets, newspaper articles, and service publications, an effort has been made to gain the support and cooperation of the public by instructing them in health matters. The results have been more than satisfactory.

#### NEWPORT NEWS, VA., AND VICINITY.

This district comprises Warwick and Elizabeth City Counties, with an area of about 100 square miles. The military and industrial activities include the shipbuilding plant in Newport News as well as one in Hampton; the Penniman plant and Torpedo base; Lee Hall and Mulberry Island developments; Camps Eustis, Stuart, Alexandria, Morrison, and Hill; Langley Field; and Fortress Monroe. It is estimated that there are approximately 175,000 people engaged in war work on the lower peninsula. The sanitary work has been carried out in cooperation with the State and local authorities and the Red Cross.

*Malaria control.*—Based on the data obtained in a survey of the area, drainage of the breeding places of *Anopheles* mosquitoes was

commenced on March 16, 1918. Most of the original work planned was completed by the end of the fiscal year, but additional territory will require attention because of the expansion of some of the camps. The total area now under malaria control is approximately 30 square miles.

*Rural sanitation.*—At the beginning of service activities there were 2,400 insanitary toilets in the area, all within the 5-mile zone. Through the work of the service, ordinances requiring fly-tight and water-tight toilets were passed in the different jurisdictions in the area. Through cooperation with local authorities, an adequate and sanitary excreta disposal plant has been constructed at Newport News, toilets of the bucket and box type are being rapidly installed in the districts without public sewerage, and an efficient scavenger system is in operation. It is believed that the entire area will be provided with sanitary privies and an efficient scavenging system before the fall of 1918.

*Control of milk supplies.*—At the beginning of the work the milk supply of Newport News was entirely inadequate and not under proper supervision. A municipal pasteurizing plant was recommended by the service, but its establishment was postponed by the city council because of unsettled conditions due to the war. However, a well-equipped privately owned pasteurizing plant has been established. During the spring and summer months the dairies have been inspected once each week. At each visit orders for improvements to be made during the ensuing week are issued. Dairymen not cooperating are prevented from selling milk products in extra cantonment zones. Bacteriological examinations are made of the milk from dairies, and those not producing milk of good quality are immediately closed. Arrangements have been made for the examination of all dairymen and milk handlers for typhoid carriers.

*Control of food supplies.*—On February 1, 1918, orders were issued by the War Department prohibiting men in uniform from patronizing eating establishments, etc., which were not certified by the service. The system inaugurated to carry out this certification involved the registration of all persons employed in such establishments, the issuance of regulations, and their strict enforcement. Inspections are made at frequent intervals over the entire territory, which includes Newport News, Phoebus, Old Point, and the smaller towns immediately surrounding the camps. Up to the end of the fiscal year 2,012 certificates, issued monthly, had been granted to food establishments and barber shops, 121 certificates had been revoked, and 3,456 inspections had been made to places where were not granted certificates. A total of 8,913 inspections were made. All food handlers in the area have been examined for typhoid carriers.

*Medical inspection of schools.*—Medical inspection of schools was commenced in November, 1917. The schools of Newport News were not visited as that city was already conducting this work in a thorough manner. The work is manifold: Inspections in school and vicinity to detect communicable diseases, physical examination of school children, efforts to obtain correction of defects discovered, smallpox vaccinations, typhoid inoculations, efforts to establish school republics, and sanitation of the schools. The response of the community as a whole to this new work suddenly inaugurated from the

outside has been hearty and gratifying, and promises much for the future.

*Public health nursing.*—The activities of the public health nurses assigned by the Red Cross constitute one of the most important adjuncts of work in connection with the control of communicable diseases in this area. During the year 988 cases were visited, and 63 sanitary kits were loaned.

*Laboratory.*—A laboratory was equipped to assist in the sanitary work in the area. Although no laboratory of this character has been maintained in the area heretofore, it is assured that the present one will be carried on by local support after the present emergency ceases.

*Control of communicable diseases.*—As a result of efforts made by the service, reporting is now being satisfactorily carried out by physicians, school authorities, and medical officers of the military forces. These persons have been urged to report any suspicious symptoms at once in order that preventive measures might be taken immediately.

All reported cases of communicable disease are investigated and are supervised until discharged as cured. Epidemiological data is obtained and spot maps of all communicable diseases occurring in the area maintained. Sanitary inspectors and nurses enforce room isolation and when necessary supply outfits of utensils and disinfectants. Upon the discharge of a case of communicable disease a thorough cleansing of the premises is carried out.

*Control of venereal diseases.*—In order to prevent the release of carriers of venereal diseases confined in the county jail, for whom habeas corpus proceedings had been instituted, a new contagious disease hospital for the detention and treatment of carriers was provided from funds furnished by Newport News, the two counties concerned, and the Red Cross. Up to the end of the fiscal year 91 patients had been admitted. A clinic for the treatment of all persons with venereal disease infection was formally opened on February 10, 1918. A close cooperation is maintained with the law enforcement and protective officers furnished by the Commission on Training Camp Activities and with the hospital just mentioned. During the year 2,015 treatments were given.

*Education.*—Numerous talks on public-health matters are given and a series of articles has been run in the daily press.

#### FORT OGLETHORPE ZONE, CHATTANOOGA, TENN.

An extra-cantonment zone at Fort Oglethorpe was established in September, 1917. The zone covers a part of the following counties: Hamilton, Tenn., and Walker and Catoosa, Ga. The headquarters for the work has been in Chattanooga, Tenn., and has been carried out in cooperation with the State and local authorities and the Red Cross.

*Malaria control.*—A malaria-control party was organized May 25, 1918, and the area around the camp was divided into three zones. During June two methods were in force—the destruction of breeding places by draining or filling, and the temporary control of such places by the use of oil. By June 30, 1,135 feet of ditching was done, 4,465 feet of reditching, 8,900 feet of rechanneling, 49,000

square feet of clearing, and 7,275 linear feet of clearing. Five hundred feet of 12-inch sewer was laid to drain Montague Pond in Chattanooga, in the course of which work 284 cubic yards of dirt was taken out. In this way a water surface of 75,000 square feet was eliminated. During June 2,329 gallons of oil were used. The service cooperated with the Army authorities in their antimalaria work.

*Rural sanitation.*—In November, 1917, an intensive survey of all rural homes was commenced. Ordinances with special reference to the disposal of human excreta and the protection of water supplies have been passed in the different counties in the zone and in the incorporated towns. In Hamilton County a scavenger system has been inaugurated, using the service can-type sanitary privies. Five hundred such privies have been installed in Chattanooga and a scavenger system adopted. The city has built a wagon which is closed and is fitted with gates, so that it is practically air tight. A large number of can-type privies and of concrete vaults have been built throughout the zone. A field survey was made of all open wells and cisterns in the area. When the examination of water samples showed that practically all were contaminated recommendations were made for their adequate protection. Emphasis has been placed on the importance of screening against flies and mosquitoes.

To June 30, the following work has been accomplished: Three thousand two hundred and twenty-four rural homes visited, 1,964 urban homes visited, 465 public places reinspected, 45 meetings held, 36 schools visited, 103 concrete privy vaults installed, 67 industrial plants inspected, 108 industrial plants reinspected, 1,983 can-type privies installed, 61 septic tanks installed, 1,345 homes revisited, and numerous lectures and public meetings held.

*Control of milk supplies.*—A milk-borne epidemic of typhoid fever occurred in Chattanooga before the service commenced operations. Consequently, a survey was made of the dairy farms and milk plants supplying milk to the city and camp. This was followed by a careful examination and scoring of these places, in co-operation with the Department of Agriculture. Chattanooga passed ordinances compelling the pasteurization of milk to be used in ice cream and frozen products and making it unlawful to make ice cream not meeting with the approval of the health commissioner of Chattanooga.

At the end of the year there were 10 pasteurizing plants, 8 of which have city water and satisfactory sewage disposal. All the employees were examined for communicable diseases and inoculated against typhoid fever. At present the total amount of milk pasteurized daily is 2,110 gallons.

Twenty-five dairies sell raw milk in Chattanooga and Hamilton Counties. Conditions at these dairies have been much improved since the service began operations. There are nearly 100 butter and buttermilk dairies, at which little work has been done.

During the year 1,179 samples of milk and 123 samples of ice cream have been taken for bacteriological analysis.

*Control of food supplies.*—Rules and regulations were drawn up for food establishments and score cards kept of infractions of these rules. If important sanitary regulations were ignored, the matter was referred to the city authorities for prosecution or a guard was

placed to prohibit soldiers from patronizing. The latter course usually resulted in producing desired conditions. During the year 686 inspections were made, 6,332 reinspections were made, 686 orders were issued for noncompliance with regulations, and 60 places either closed voluntarily or were put out of business.

*Medical inspection of schools.*—In March, 1918, the medical inspection of the 6,000 school children in Chattanooga was commenced. By the end of the fiscal year all of the children had been examined, and the most important cases needing treatment had been visited.

A survey of the county schools was made and talks were given to parent-teachers associations and pupils.

*Public health nursing.*—A council of public-health nurses was formed, to coordinate the work of the various nursing agencies. Special emphasis in the nursing work has been placed upon tuberculosis cases. More than 65 such cases have been visited frequently, and in some cases arrangements have been made for removal to a tuberculosis sanitarium. A male nurse has been on duty during the last part of the year.

*Laboratory.*—An efficient laboratory was organized at the inception of the work. In addition to routine examinations, it has assisted in investigations throughout the zone, especially of all communicable diseases, including venereal.

*Control of communicable diseases.*—The cooperation of physicians was enlisted in the securing of morbidity reports, which were made use of in the control of communicable diseases. As many cases of the diseases of childhood are not attended by physicians, the cooperation of the teachers was also enlisted. The service made epidemiological investigations of the more important diseases.

During an epidemic of meningitis special emphasis was placed on the education of the public in the control of this disease. Regulations prohibited children under 16 from visiting public places, although the schools were allowed to remain open under constant medical supervision.

A summary of the work accomplished follows: Investigations made of 71 smallpox cases, 53 typhoid fever, 4 paratyphoid fever, 60 scarlet fever, 41 diphtheria, 57 meningitis, 65 tuberculosis; 67 diphtheria cultures were taken; 364 cultures were taken of meningitis contacts; 3,308 examinations of employees of public places were made, and 101 communicable diseases found among them; 2,333 vaccinations against smallpox were made; and 2,904 typhoid inoculations were made.

*Control of venereal diseases.*—A Government clinic for the control of venereal diseases was organized in February, 1918. The State law exempted from reporting or enforcing quarantine of all venereal cases, but an order of the State board of health required reporting and gave municipal authorities power to quarantine cases in the communicable stage. On a test case of habeas corpus proceedings, the order of the board of health was upheld, and since that time there has been no difficulty in quarantining cases.

During the year 758 patients have been examined, 3,693 treatments given, 3,386 smears taken for examination, 139 specimens taken for Wasserman examinations, and 243 doses of arsenobenzol given.

An industrial clinic for males is now being organized.

*General sanitation.*—Barber shops have been surveyed and sanitary rules and regulations drawn up. Public places were investigated to improve their ventilation. In the spring an antily campaign was instituted and all owners of stables were compelled to install fly-tight bins and to keep the stables clean.

#### ORANGE, TEX.

In connection with the work at Gerstner Field, La., the service supervised antimalaria operations carried out in Orange, Tex., for the protection of 200 guards and approximately 6,000 shipbuilders. This work has consisted of draining large swamp areas. A fund of approximately \$4,700 was subscribed by shipbuilding companies and other large business interests vitally concerned.

#### PAYNE FIELD ZONE, WEST POINT, MISS.

Payne Field, a flying field, was located in the spring of 1918, 4 miles north of West Point, Miss., a city normally of about 5,000. It is located in one of the worst malaria belts of the United States and the local topography favors the breeding of mosquitoes. Work in this zone was limited to malaria control, and was carried out in cooperation with State and local health authorities.

*Malaria control.*—It has been the experience of local physicians that 20 per cent of their practice are malaria cases and that 60 per cent are due indirectly to or complicated with malaria. They estimate that 75 per cent of the people are infected with the organism.

Antimosquito work was commenced by the service on April 15, 1918, with the expectation of controlling mosquito breeding before the height of the season is reached (September and October). At the end of the fiscal year the ditching and drainage project was 45 per cent completed. Sixteen miles of clearing of streams was carried out, ditching being done afterwards where necessary. Oiling was practically all done by spray.

#### CAMP PIKE ZONE, LITTLE ROCK, ARK.

Sanitary work in Little Rock, Ark., under the supervision of the service, was started during June, 1917, in cooperation with State and local authorities and the Red Cross.

*Malaria control.*—Oiling and drainage work for mosquito control was commenced in the area adjacent to the camp site and in the city proper just before the beginning of the fiscal year. During 1917 the area reached by mosquito-control measures was 61.5 square miles. In 1918 the control work was extended to include the Fort Roots reservation and the site of the new Government munition plant at Picon. Later the Army authorities took over control of some of the area previously cared for under the supervision of the service. At the end of the fiscal year 20 miles were under control by the Army authorities and 50 miles by the service. During the fiscal year 223 miles of streams were drained or ditched and several swamps or ponds were drained. Of this amount 86.68 miles were in the areas the control of which was later taken over by the Army. In the summer



of 1917, 21,515 gallons of oil were used, or approximately 11 gallons per mile of stream per week. In the summer of 1918, up to the end of the fiscal year, 13,162 gallons of oil have been used, also 11 gallons per mile of stream per week. An inspection system has been adopted by which all areas are covered by the inspectors at intervals of from 6 to 10 days.

No new cases of malaria have developed at the camp, either during construction or since occupancy, and no new cases have developed at Fort Roots. Statements of physicians tend to show that the reduction in malaria throughout the area has been very marked. Only 10 cases not giving a history of previous attacks were reported in the control area from January to July, 1918. Nine deaths were reported as due to malaria in the past fiscal year, against 40 in 1916-17 and 56 in 1915-16.

*Rural sanitation.*—A rural sanitation survey was commenced in Pulaski County in August, 1917. In this work 4,360 homes were visited, 107 schools inspected, 70 stores inspected, 61 churches inspected, 13 depots inspected, and 161 public addresses on sanitation given. Following the completion of the survey, construction of sanitary privies and cement vault privies was commenced. By the end of the fiscal year 67 sanitary privies had been built, 100 cement vault privies installed, 4 large cement-vault privies installed at school-houses, 152 reinspections made of privies, 7 wells inspected and condemned, and 4 houses vacated as insanitary. Contracts have been secured for 80 additional cement-vault privies.

*Control of milk supplies.*—During the fiscal year just closed 541 dairy farms, 120 creameries, 38 dairy barns, 124 dairy wells, and 126 milk receiving plants were inspected; 1,148 dairy cows were physically examined; 1,107 dairy cows were tested for tuberculosis; and 206 sanitary privies were inspected. Steady improvement is being made in the quality of milk furnished.

*Control of food supplies.*—In August, 1917, the service began the inspection and certification of food handling establishments in Little Rock. This has consisted of a complete general sanitary inspection of the entire premises, examination of employees for communicable diseases, and vaccinations against typhoid and smallpox. Army authorities have assisted in the work. During the year 496 restaurants, 602 meat establishments, 160 soda fountains, 57 bakeries, 37 grocery stores, 42 ice-cream factories, 147 cafés, lunch rooms, etc., and 10 bottling works were inspected; 3,897 physical examinations and 833 reexaminations were made; and 623 visits were made to investigate communicable diseases. Including those made at rural homes, 53,316 antityphoid inoculations were made. It is worthy of note that not a single serious complication resulted.

*Medical inspection of schools.*—The service took over the medical inspection of school children in Little Rock in December and extended this work to North Little Rock and the rural districts of Pulaski County. During the fiscal year in Little Rock and North Little Rock 6,536 children were examined, 3,549 defects found, 148 children excluded for communicable diseases, 1,024 visits made to homes, 56 talks made, 88 schoolrooms inspected, 213 surgical dressings done, 140 children taken to clinics, 290 children excluded for re-vaccination, and 101 excluded for uncleanness. A dental clinic was

established on March 25 and 475 school children had received dental treatment by the close of the fiscal year. A preliminary nursing course has been established in the high school, lecturers having been furnished mostly by the service. In the rural districts 952 children were examined, 438 defects found, 434 treatments advised, 46 sanitary inspections of buildings and grounds made, and 18 talks given.

*Public-health nursing.*—Activities in public-health nursing, outside of such work in the schools, was postponed in great measure until June, 1918, in which month 127 homes were visited.

*Laboratory.*—The work of the laboratory has steadily increased in amount. A total of 2,308 examinations of all kinds were made. In addition the State hygienic laboratory performed work in connection with the examination of isolated female venereal patients.

*Control of communicable diseases.*—It is believed that the reporting of communicable diseases is steadily increasing in reliability, although by no means complete. A study of death certificates has been made to check up cases. Small epidemics of meningitis and smallpox occurred and have required active work on the part of the service.

*Control of venereal diseases.*—An effort has been made to enforce the State regulations in regard to the control of venereal diseases. An out-patient clinic has been conducted and infected women arrested for prostitution have been detained and treated. An effort is being made, with considerable success, to enforce the weekly reporting of drugs purchased from drug stores for the treatment of venereal diseases. During June 220 cases were reported by druggists, 160 notices were mailed to patients to appear at office, and 156 appeared, 128 of whom had gonorrhea and 28 syphilis. In addition 262 soldiers were reported to military authorities in May and June as having purchased such drugs.

*General sanitation.*—Efforts have been made to improve general sanitary conditions, this work being as follows: Twelve thousand four hundred and thirty-six miscellaneous inspections made, 794 inspections of stables, etc., made, 2,607 notices served to fill wells, 46 notices served to close cisterns, 215 notices served to repair wells and pumps, 430 notices served to abolish water containers, 1,924 notices served to install automatic flush toilets, 1,289 notices served to install fly-proof privies, 756 notices served to install fly-proof containers for manure, 232 notices served to remove garbage and rubbish, 312 notices served to milk producers to comply with regulations, 2,308 miscellaneous notices served, 116 premises placarded as insanitary, 104 warning notices served to prevent garbage dumping, 2,067 complaints received and investigated, 157 cases taken to court, 2 cisterns closed, 849 wells closed, 1,616 sanitary privy cans installed, 535 stables put into sanitary condition, 984 water connections made, 975 sewer connections made.

#### PORTSMOUTH-KITTERY CIVIL SANITARY DISTRICT, PORTSMOUTH, N. H.

On the request of the Navy a civil sanitary district was established around a navy yard located at Kittery, Me., in May, 1918. The following area was tentatively decided upon as requiring intensive sanitary work: The towns of Kittery, York, and Eliot, in Maine, the city of Portsmouth and the towns of Newington, Greenland, Rye,

North Hampton, and Hampton, in New Hampshire, together with the adjacent rural districts. The service officer in charge was made deputy State health officer in Maine, local health officer for York, Eliot and Kittery, Me., and Portsmouth, N. H., and was empowered to act for the State board of health of New Hampshire in the sanitary district.

The development and improvement of general sanitary conditions and the establishment of effectual control over communicable diseases has been handicapped because of the absence of local regulations governing these problems. Therefore, the first work undertaken has been the drawing up of satisfactory regulations. At the end of the year organization for carrying on the work had been established.

#### PORTSMOUTH AND NORFOLK COUNTY HEALTH DISTRICT, NORFOLK, VA.

A health district was established by the service in cooperation with the Portsmouth city health department, the Norfolk County health department, and a unit of the Red Cross.

*Malaria control.*—For the protection of the naval base and quarter-master terminals, 44,725 feet of new ditching and 22,675 feet of re-ditching operations were carried out; at South Norfolk 11,450 feet of new ditching and 7,100 feet of re-ditching; at Port Norfolk, Mount Hermon and Pinners Point, 18,768 feet of new ditching and 38,396 feet of re-ditching; at Portsmouth, 100 feet of new ditching and 3,660 feet of re-ditching. In all 75,043 feet of new ditching and 71,831 feet of re-ditching operations were carried out during the fiscal year.

*Control of milk supplies.*—Fourteen dairies have been inspected, three of them being scored in detail.

*Control of food supplies.*—During the year 183 inspections and 160 reinspections were made of food establishments. Seventy-seven stores were in a dirty condition, and 75 in a sanitary condition.

*Medical inspection of schools.*—The medical inspection of schools has been under the supervision of the boards of education, and, under the circumstances, the amount of work accomplished has been gratifying.

*Public health nursing.*—The following figures will show the results accomplished during the fiscal year by the public health nurses: Two hundred and fifty-six tuberculosis cases were under supervision and 1,468 visits were made to them; in addition 114 visits of cooperation were made concerning these cases and 50 visits were made to contacts of the cases; 12 typhoid fever, 23 measles, 15 malaria, 7 scarlet fever, and 18 whooping-cough cases were under supervision; and 90 scabies cases were treated. As a part of the infant-welfare work, 724 visits were made to babies, 132 revisits were made to babies, 42 babies were examined by physicians, and 99 babies were maintained in the clinic.

*Laboratory.*—At the laboratory which was maintained by the service in connection with the work in this zone, many examinations were made to assist in the diagnosis of disease. In addition bacterial tests for the presence of colon bacilli and number of bacteria in the city water supply have been made twice a week. The ice supply used for human consumption in Portsmouth is subject to weekly tests.

*General sanitation.*—During the fiscal year 10,709 inspections were made, 9,043 of these being of dwellings, 761 of stores, etc., 339 of stables, and 174 miscellaneous. Two hundred and twenty notices were served to improve sanitary conditions and eight cases were taken to court.

#### CAMP SEVIER ZONE, GREENVILLE, S. C.

The extra-cantonment zone around Camp Sevier, located 3 miles north of Greenville, S. C., was established in August, 1917. The zone comprises an area of 144 square miles. Work was carried out in cooperation with the State and local health authorities and the Red Cross.

*Malaria control.*—Malaria control was carried out for a zone extending for 1 mile in all directions from the camp, an area of 20 square miles. The construction work was entirely completed during the fiscal year. Three hundred gallons of oil were distributed, 13½ miles of ditching were carried out, 6 miles of channels were cleaned, and 1½ miles cleared. Only two cases of malaria have been reported in the malaria zone.

*Rural sanitation.*—In the rural-sanitation work, 713 homes were surveyed in the 5-mile zone. Of this number 43 already had sanitary means for disposing of excreta. At 440 homes double-compartment concrete privies have been completed since the survey, and 210 have material on the ground for such privies.

*Control of milk supplies.*—All milk served in public eating places is now pasteurized. A total of 280 inspections of dairies were made. All but 5 of the 14 supplying milk in the city pasteurize their milk, and the others are preparing to install pasteurizers.

*Control of food supplies.*—Inspections made for the purpose of controlling food supplies were the following: Nine hundred and two restaurants, 49 bakeries, 405 lunch stands, 156 ice-cream manufactories, 377 fruit stands, 259 soda fountains, 212 meat markets, 77 fish markets, 346 food and drink dispensaries not included above, and 21,026 pounds of meat.

*Medical inspection of school children.*—During the year 1,588 original examinations of school children and 213 home visits were made.

*Public health nursing.*—Public health nurses made 2,310 instructive home visits and 1,883 nursing home visits. Thirty-one small-pox vaccinations and 135 typhoid inoculations were carried out. A great deal of other work was also done.

*Laboratory.*—The laboratory work included the examination of 187 water samples, 211 spinal-fluid samples for meningitis, 149 sputum samples for tuberculosis, 599 cultures for meningococci, 270 milk samples, 113 urine samples, and 130 smears for gonococci.

*Control of venereal diseases.*—A Government clinic was established on February 15, 1918. At the end of the fiscal year the daily average attendance was 75. During the year 268 males were treated for syphilis, 370 for gonorrhea, and 23 for chancroid; 166 females were treated for syphilis, 632 for gonorrhea, and 2 for chancroid; 434 treatments were given for syphilis, 1,002 for gonorrhea, and 25 for chancroid; and 143 doses of arsphenamine were given.

## CAMP SHERIDAN ZONE, MONTGOMERY, ALA.

An extra-cantonment zone was established around Camp Sheridan in August, 1917, with headquarters at Montgomery, Ala. Sanitary control was also established in the vicinity of Taylor Field (aviation field), Wright Field (aviation repair and assembly shops), rifle range, and remount station. Work was carried out in cooperation with the Red Cross and the State and local authorities.

*Malaria control.*—Approximately 85 square miles of territory have been covered by the service in malaria-control work, zones having been established around the camps and fields just mentioned and work having been carried out in Montgomery and in a zone surrounding that city.

From August, 1917, to the end of the fiscal year, 16,343 gallons of oil were distributed in order to limit the breeding of mosquitoes: 103 linear miles of ditches were dug; 33 miles of existing ditches were cleared of shrubs and brush; 12 miles of ditches were rechanneled; and approximately 30 acres of low swampy land were cleared of brush. But few drip cans were used at this station, because it was found that better results could be obtained through the use of oil-soaked cotton waste or sawdust. The method was found convenient, simple, and economical. The oily waste is anchored just below the surface of the water over which it is desired to spread a film. It was found by experiment that this method would create an evenly-distributed film of larva-destroying oil for periods ranging from 24 to 72 hours. The sawdust, soaked in oil, has also been found to be efficacious in creating a destructive film.

As a result of the service operations, the inhabitants of Montgomery and the surrounding territory have noticed a marked diminution in the number of mosquitoes, while the physicians state that there are fewer cases of malaria than at any time in their knowledge.

*Rural sanitation.*—In the 5-mile zones surrounding Camp Sheridan and Camp Taylor (aviation field), 1,623 homes had been visited and 1,132 double-vault concrete privies constructed under the direction of the service up to the close of the fiscal year.

*Control of milk supplies.*—The situation in regard to the milk supply in Montgomery has been bad, a fairly satisfactory milk ordinance having never been enforced. To improve the milk supply producers have been informed that as soon as they can make arrangements they will be required to pasteurize milk in individual containers where it is to be used by soldiers patronizing city restaurants. It is also expected to require that only pasteurized milk and cream be used in making ice cream. During the year 95 dairies were inspected and 2,181 cows tested for tuberculosis.

*Control of food supplies.*—One of the important features of the local service work was the control of food supplies, so that soldiers might be provided with safe food and drink in clean establishments within the city of Montgomery. With the aid of the military authorities it has been practicable to post the decent places and prevent soldiers from entering the others, and few have been able to withstand the pressure brought to bear by the service. All persons handling food and drink have been required to present themselves at frequent intervals to the Government clinic for examination for the

presence of venereal disease. Physical examinations were made of 984 food handlers in May and June. Inoculation against typhoid fever has also been required of such persons. At the end of the fiscal year 48 restaurants, 26 soda fountains, and 22 meat markets were under inspection.

*Medical inspection of schools.*—Medical inspections of schools was carried out from March to June, 1918. In 13 schools in Montgomery 5,716 children were examined and 533 children with serious defects were noted. The parents of these children were requested to consult their family physicians in regard to correcting the defects. A number of mentally defective children were found, and consequently it was recommended that a special class for mentally inferior children be established.

*Public health nursing.*—Visits have been made by the public health nurses to patients suffering with communicable diseases, and the families have been given instruction regarding methods of prevention and cure. Up to the end of the fiscal year 2,727 instruction visits were made.

In June, 1918, an infant-welfare station was established and a milk station was established in connection with it. It is believed that so clear a demonstration of the need for such a clinic has already been made that it will be continued in operation after the Government has withdrawn its support.

*Laboratory.*—The major portion of the work required by the service in this zone has been performed at the laboratory of the city health department and some at that of the State health department, which is located in Montgomery.

*Control of communicable diseases.*—Efforts have been made to improve the reporting of communicable diseases. During the fiscal year the service in this zone has been particularly concerned with the suppression of smallpox, cerebrospinal meningitis, and typhoid fever. A smallpox epidemic occurred in the early part of 1917 and was met by extensive vaccination of the people of Montgomery. Up to the end of the fiscal year 24,081 vaccinations had been made. A sharp outbreak of meningitis was controlled by isolation of patients and search for carriers. Because of the existence of 6,124 surface privies typhoid fever has been on the increase. The situation has been met by the installation of sanitary privies and the use of extensive inoculations against typhoid fever.

*Control of venereal diseases.*—A Government clinic for the treatment of venereal diseases was established in March, 1918. By the end of the fiscal year it was apparent that progress had been made in limiting the number of cases of venereal disease in Montgomery.

*General sanitation.*—As stated above, a survey of Montgomery showed that there were 6,124 surface privies in the city. Practically all of these were in such filthy condition that it was deemed necessary to supplant them. By the end of the fiscal year the necessary cans for the box and can type of sanitary privy had been received and the installation of the privies had been begun. It is expected that the sanitary conditions in Montgomery will be improved 50 per cent, at least, by the installation of sanitary privies.

In so far as possible, the service has attempted to abate nuisances, especially those associated with the breeding of flies and mosquitoes.

In this field, however, the service has not taken over the work normally conducted by the city health department.

CAMP SHERMAN ZONE, CHILLICOTHE, OHIO.

On October 27, 1917, the extra-cantonment sanitation of Camp Sherman was taken over by the service, in cooperation with the State and local authorities and the Red Cross.

*Rural sanitation.*—The work in rural sanitation has consisted chiefly in visiting the homes, making inspections, and giving instructions regarding necessary improvements. Water supplies found pure were so posted. The sanitary conditions in the rural homes were found to be much above the average.

*Control of milk supplies.*—Careful supervision of milk supplies has been maintained. Samples of milk from the distributors were examined weekly. Eighty-six dairies were inspected and 150 visits made.

*Control of food supplies.*—Maintaining sanitary conditions in eating places has required constant vigilance. Approval cards were given to those maintaining the required sanitary conditions. All employees of restaurants, bakeries, ice cream and food establishments were required to be examined by medical officers to determine their freedom from communicable diseases. Inoculations against smallpox, typhoid, and paratyphoid were required of all food handlers. In all 95 restaurants were inspected, 1,551 restaurant-inspection visits made, 21 soda fountains inspected, 244 visits to such places made, 100 meat-market inspections, 5 restaurants closed, 5 retail meat wagons abolished, 1,219 physical examinations made of food handlers, and 458 inoculations made against typhoid fever.

*Medical inspection of schools.*—In cases of threatened epidemic, the service assumed charge of the sanitation of the schools until normal conditions were restored. During a smallpox epidemic occurring coincident with the service taking charge of the sanitation of the zone the vaccination of all nonimmune children was required.

*Public-health nursing.*—The work of the Red Cross nurses included 885 nursing visits, 1,270 instruction visits, 105 school visits, and 600 follow-up visits.

*Laboratory work.*—A laboratory equipped by the State and maintained by the Red Cross has assisted in the sanitation work.

*Control of communicable diseases.*—Measures were taken at once to obtain an accurate knowledge of the presence of these diseases by requesting all physicians to report promptly, and the physicians have cooperated well in this respect. Lack of hospital facilities and crowded conditions in Chillicothe have made the control of these diseases difficult. However, all the diseases excepting measles and German measles have been kept fairly well in check.

*Control of venereal diseases.*—A clinic was opened February 15, 1918. Difficulty has been met with because of the absence of any ordinance authorizing the apprehension, examination, and detention of any person reasonably suspected of having venereal disease. An ordinance of this kind has now been passed by the State department of health and will go into effect July 1.

*General sanitation.*—Water supplies of the population of Chillicothe not supplied from the city were tested, and when pollution

was found the owner was advised to boil the water unless pollution could be prevented in other ways. A complete house-to-house survey of the city was made in regard to the matter of sewage disposal. All property owners accessible to sanitary sewers were ordered to connect with them, 233 such connections being made up to the end of the fiscal year. Where sewers were not available, owners were ordered to put in water-tight, fly-proof vaults.

The owners of the 216 stables in the city were required to provide proper manure bins to prevent fly breeding and to remove the manure frequently. Other measures relating to general sanitation have been carried out.

#### SOUTHER FIELD ZONE, AMERICUS, GA.

In cooperation with State and local health authorities, an extra-cantonment zone was established around Souther Field, an aviation camp  $3\frac{1}{2}$  miles northeast of Americus, Ga., on April 14, 1918. The camp covers an area of about two-thirds of a square mile. Americus, having a population of 8,063 in 1910, covers an area of about 5 square miles.

*Malaria control.*—An area of about 13.5 square miles was found to contain numerous mosquito-breeding areas within easy flight distance of the camp and of the populated sections of Americus. The work up to the end of the fiscal year consisted of draining and oiling of ponds. Plans were completed for clearing Town and Muckalee Creeks, lowering the water sufficiently in the latter to drain swampy areas which are breeding *Anopheles* profusely.

*Rural sanitation.*—At the close of the fiscal year a sanitary survey was being conducted to determine the condition of privies in the town of Americus. It was found that there were many privies in the town, all of which were in an insanitary condition. At the conclusion of the survey the question will be taken up with the city council in an effort to enforce sewer connection where there are sewers and the installation of fly-tight sanitary privies where there are no sewers.

*Control of milk supplies.*—On recommendation from the service, the six or seven dairies furnishing milk to the camp and the city agreed to sell their milk to a firm which would pasteurize and distribute the milk. At present all milk furnished the camp, all milk furnished certified eating places, and probably 90 per cent of the milk sold in Americus is pasteurized.

*Control of food supplies.*—Eating places and soda fountains patronized by soldiers were inspected, required to screen, sterilize glasses, clean, paint, and otherwise put their places in sanitary condition by a certain date, reinspected, and given certificates if they had complied. Meat markets, grocery stores, fruit stores, etc., furnishing food products to the camp or to soldiers individually were likewise required to clean up to secure certification.

*Control of communicable diseases.*—A law requires the reporting of contagious diseases, births, and deaths, but it has not been enforced. An effort is now being made to secure enforcement and to make use of the reports. This will make it possible to encourage treatment of malaria cases until the danger of infecting mosquitoes



is past and also permit preventive measures against the spread of typhoid and other diseases. At present typhoid inoculations are being made on request, and persons suspected of having malaria are encouraged to take quinine.

*General sanitation.*—Barber shops were inspected and required to provide for the sterilization of tools and towels and to make other sanitary improvements.

#### CAMP ZACHARY TAYLOR ZONE, LOUISVILLE, KY.

A civil sanitary district was organized about Camp Zachary Taylor in July, 1917, the following local jurisdictions being involved: State of Kentucky; county of Jefferson, Ky.; cities of Louisville and Highland Park, in this county; county of Hardin, Ky.; town of West Point, in this county; State of Indiana; county of Clark, Ind.; city of Jeffersonville, in this county; county of Floyd; and city of New Albany, in this county. The work was organized by the service in cooperation with the health authorities of these jurisdictions and the Red Cross.

*Malaria control.*—In the fall of 1917 an area of 25 square miles was covered in connection with malaria-control work, 7,500 gallons of oil were used in spraying mosquito-breeding places, 52 miles of ditches were dug for drainage purposes, and underbrush and rank vegetation along the ditches and ponds within the 25-mile area were cleared. Before the arrival of any troops at Camp Taylor all mosquito breeding within the zone was under control. During the present year little new construction work was necessary. Approximately 500 gallons of oil were used.

Due to the establishment of an Artillery range at West Point, in Hardin County, in May, 1918, antimalaria operations were undertaken. The breeding was easily controlled by proper ditching and the use of 250 gallons of oil.

Because of the proximity of Jeffersonville and New Albany, Ind., to Camp Taylor, and also because of the location of the quartermaster's depot at Jeffersonville, these two cities were included in the sanitary district. Anopheline mosquitoes were found very prevalent in this area, and drainage and oiling measures were carried out to prevent the spreading of malaria infection.

*Rural sanitation.*—An intensive survey of rural sanitary conditions in the 5-mile zone was made in the summer of 1917, 2,885 homes, schools, stores, churches, and dairies being surveyed and the results tabulated. Immediately afterwards the installation of sanitary privies of the type known as Kentucky sanitary privies was begun. Before the end of the fiscal year sanitary privies had been installed in every home in the 5-mile zone. Individual householders furnished material for the privies, and the construction was done by the joint sanitary authorities, 398 by the service unit, 203 by the Red Cross unit, and 334 by the Jefferson County unit.

The area around Camp Taylor contains numerous truck farms. The operators of the farms have been heretofore in the habit of scattering manure on their land in the summer and plowing it under in the fall. At present all stable manure within  $1\frac{1}{2}$  miles of the camp is required to be screened or plowed under promptly during

the fly season. Scavengers are no longer permitted to dump human excrement within the area without properly burying it.

A sanitary survey was made in the vicinity of West Point, Ky., similar to that made around Camp Taylor.

*Control of milk supplies.*—A division of milk and food was established during the reorganization of the health department of Louisville. Samples of milk and ice cream have been regularly obtained from the agencies distributing these products, and chemical and bacteriological analyses have been made and published.

*Control of food supplies.*—Upon the completion of Camp Taylor many small eating places and soft-drink establishments sprang up near the camp. These have been required to comply with the State laws in regard to ventilation, lighting, screening, etc. Sanitary approval cards were given to those complying with all sanitary requirements in regard to the sale of food.

Thirty small insanitary slaughterhouses existed in Louisville when the sanitary district was established. After a struggle 14 of the worst offenders were closed, some others consolidated, so that at present there are 12 slaughterhouses, all complying with sanitary regulations.

A general clean-up was made of West Point when the service took charge because of the establishment of an artillery range there, and a system of sanitary inspection and sanitary approval cards were instituted.

*Medical inspection of schools.*—An inspection of schools and examination of school children has been made over one-half of the area of Jefferson County, Ky., 56 schools having been visited. The total number of children examined was 2,810 and the total number of defects found 7,510. The results of the examinations were tabulated on cards left as permanent records for the use of the schools. Seventy-three cases of trachoma were found in the schools. Of these 27 were operated on at the United States Marine Hospital, and the remainder are now under medical treatment.

*Control of communicable diseases.*—In the reorganization of the health department of Louisville a division of communicable diseases was established, which has stimulated prompt reporting in every way possible, has made epidemiological investigations of communicable diseases, and has assisted in enforcing regulations in regard to such diseases. On recommendation the previous regulations were changed to conform to the recommendations of the committee from the American Public Health Association.

A campaign of antityphoid inoculations has been carried out in the zone around Camp Taylor exclusive of Louisville. Up to the end of the year 1,071 antityphoid inoculations had been made.

*Control of venereal diseases.*—The problem of venereal disease control among the civilian population of the civil sanitary district has been the greatest health problem encountered, and more effort has been expended on its solution than on any other phase of the work. The first step in the direction of the control of these diseases was the establishment of a clinic, in connection with the city hospital of Louisville. In the six months ending June 30, 1918, 2,125 new cases were treated, 6,982 treatments given, 742 Wasserman examinations made, and 717 doses of arsphenamine administered.

Before the end of the fiscal year the recommendations of the Surgeon General of the Army, Navy, and Public Health Service in regard to the control of venereal diseases were adopted by the State and county boards of health and ordinances based thereon were passed.

As a result of these recommendations, a venereal clinic was established in the county jail on May 4, 1918, where known prostitutes and persons apprehended by the police on the suspicion of their being prostitutes have been examined, quarantined, and held for treatment. At this clinic 150 Wasserman examinations were made up to the end of the fiscal year, 145 were examined for gonococci, 83 cases of syphilis were discovered, 51 cases of gonorrhea were discovered, and 62 doses of arsphenamine were administered.

*General sanitation.*—When the health department of Louisville was reorganized, a division of sanitation was established. There was an indefinite number of old privy vaults in the central part of the city, and despite much opposition, a practical plan of gradual closing up of these privies was worked out, and is now well under way toward accomplishment. When the service took charge, Louisville had no system of garbage collection and disposal. At present, under a new ordinance, the city is collecting the garbage and feeding it to hogs outside the city limits.

#### CAMP TRAVIS ZONE, SAN ANTONIO, TEX.

The district in which sanitary control has been maintained by the service in cooperation with the local authorities and the Red Cross comprises the city of San Antonio, certain residence additions to the city, and the remainder of Bexar County in the vicinity of the Army camps. Seven Army camps are located in this county, including Camp Travis, Fort Sam Houston, Kelly Field, Nos. 1 and 2, Camp Stanley, Camp Bullis, Camp John Wise, and Brooks Field.

*Malarial control.*—Preliminary surveys of mosquito-breeding conditions were made in April, 1918, and antimosquito measures were inaugurated throughout the zone. The results of the malaria-control operations are self-evident, inasmuch as the amount of breeding has been checked and practically no adult *Anopheles* are being found. Malaria is under control at the different camps. By the end of the fiscal year, 19,624 feet of banks had been treated, 30,322 cubic feet of cuts made, 27,032 cubic feet of fills made, and 23,000 linear feet of clearing done.

*Control of milk supplies.*—In an effort to improve the quality of milk supplies, milk was required to be sold in individual containers. Gradually and by meetings with dairymen and proprietors of the creameries and educational talks with the housekeepers, an attempt was made to create a popular demand for pasteurized milk. Later the restaurants were compelled to sell only pasteurized milk. As a result, dairymen and creameries are installing pasteurizers, and it is expected that a plentiful supply of pasteurized milk will soon be available for restaurants, the Army camps, and the householders. During the year 609 inspections were made of dairies and 104 of creameries.

*Control of food supplies.*—Soldiers are not permitted to patronize food establishments not certified by the service. Rules and regula-

tions were adopted for the sanitary control of such places. Cooperation of the military police in enforcing sanitary control has been most satisfactory and the most favorable comments have been made in regard to the greatly improved condition of all such places since the inauguration of the work. The following inspections had been made up to the end of the fiscal year: Restaurants, 2,403; ice-cream parlors, 679; soda-water stands, 1,167; bakeries, 768; hotels, 113; confectioneries, 154; fruit stands, 137. Many of the places inspected were 25 miles distant from San Antonio. Ten bottling works in San Antonio are kept under constant supervision. During the year 137 inspections were made.

There are five slaughterhouses and three wholesale packing houses in San Antonio. A very marked improvement in the condition of the sausage room and the slaughtering platform has been noted since supervision was undertaken by the service, such as screening against flies. Thirty inspections were made of meat markets, 101 of slaughterhouses and 108 of fish markets.

*Public health nursing.*—Public health nursing is directed mainly to the control of communicable diseases, bedside sanitation, and instructions as to prevention of the spread of disease being given to the patient and his family. During the last weeks of the year the nurses were combining with their other work inoculation against typhoid fever for the immunizing of contacts and neighbors. In the field of child welfare, the nurses have done good work in prenatal instruction, postnatal care, and feeding. During the year 5,202 nursing visits and 1,866 instructive visits were made, and 1,156 patients were treated.

*Laboratory.*—A laboratory was established and equipped in March, 1918. It has been mainly occupied in doing diagnostic work for the clinic established by the Red Cross, the work including 848 Wassermanns and 984 gonococcus smears. An investigation of samples of milk was begun about the middle of June.

*Control of communicable diseases.*—Requests for the reporting of communicable diseases were sent to physicians, but did not meet with any very encouraging response. It has not been possible to secure legal action in the case of the physicians not reporting. At the end of the fiscal year 52 out of 217 physicians were not reporting to the service headquarters. The relation of the public health nurses to the control of communicable diseases and typhoid fever inoculations is mentioned above. A medical inspection was made in the Mexican quarter of San Antonio.

*Control of venereal diseases.*—A clinic for the control of venereal diseases was opened on February 25. The work has steadily expanded. From March 1 to June 30 the following work was accomplished: Three thousand eight hundred and twenty-one cases of gonorrhea, 1,211 cases of syphilis, and 120 cases of chancroid were treated; 213 doses of salvarsan were administered. There was an average daily attendance of 51 and a total attendance of 8,615.

*General sanitation.*—Inspection was made of theaters on complaints of insanitary conditions. The patronage of the soldiers was denied to eight such places. In this work the service cooperated with the State and local fire marshals, with a view to securing changes which would make the theaters safe from danger of fire. Thirty-three theaters are under inspection.

A sanitary survey of San Antonio was made to secure compliance with sanitary ordinances and regulations of the city, special attention being paid to insanitary privies, of which there were a great number. In meeting the problem the line of attack was to secure the removal of pit-type privies and the fly-proofing of other privies.

VANCOUVER ZONE, VANCOUVER, WASH.

In cooperation with State and local health authorities, an extra-cantonment zone was established in Vancouver, Wash., and vicinity on January 17, 1918.

*Control of milk supplies.*—Supervision was maintained over milk supplies. Up to June 30th 222 inspections had been made of dairies and 49 of milk depots.

*Control of food supplies.*—During the fiscal year 860 inspections were made of restaurants, 104 of bakeries, 277 of meat markets, 819 of ice-cream and soda parlors, 82 of fish markets, 10 of candy factories, 112 of food-delivery wagons, 327 of grocery stores, 23 of slaughterhouses, and 28 of bottling works.

*Public health nursing.*—The total number of public health nursing calls made up to the end of the fiscal year was 602, 263 of these being for contagious diseases. One hundred and forty-five were for German measles, 67 for measles, 27 for mumps, 18 for whooping cough, 4 for chickenpox, and 2 for pneumonia.

*General sanitation.*—During the year 392 inspections of barber shops were made, 2 of manicuring parlors, 237 of hotels and rooming houses, 148 of residential barns in rural districts, 10 of stables, and 24 of laundries. One hundred and sixty-one water samples were collected and examined.

The total number of inspections, including those in regard to milk and food control, was 8,266. As a result, 3,688 nuisances were found, 2,181 nuisances were abated, 3,658 notices were served, and 757 health certificates were issued.

CAMP WADSWORTH ZONE, SPARTANBURG, S. C.

An extra-cantonment zone was established around Camp Wadsworth, located 4 miles north and west of the limits of Spartanburg, S. C., on September 13, 1917. The bulk of the work was done in Spartanburg, which has a full-time county health officer, but which was unable to assist financially in the sanitary work. The county has no health officer. The service officer in charge was made deputy city health officer, and was also delegated by the State as deputy State health officer in the zone. The Red Cross assisted in the work.

*Malaria control.*—No large malaria problem was met, the work in general consisting of the cleaning of banks of small streams and ponds and the digging of seepage ditches. No extensive swamps existed. During the fiscal year 37,000 feet of brooks and streams were cleaned and 14,000 feet of ditching was carried out. This represents about 75 per cent of the total work necessary. The majority of the small streams are being handled by oiling through the use of drip cans. The results of this work are noted in remarks of citizens of the absence of mosquitoes.

*Rural sanitation.*—Following a survey of rural sanitary conditions, it was decided that the double-compartmented concrete vault was the best solution of the privy problem in this territory. Little trouble was met with in securing the cooperation of the farmers. By the end of the fiscal year 249 privies had been completed, with 182 in use. Seventy others were in course of construction. The cost per privy for the year was \$24, and for the last 120 privies built the cost averaged \$18. Inspection of the privies at the end of the fiscal year showed them to be working satisfactorily in spite of improper use in many instances.

Sanitary work was also carried out in the mill villages scattered throughout the zone. The problem of excreta disposal was great in each. Mill owners and officials were cordial and cooperated with the service in improving conditions. By the end of the fiscal year each owner had installed approved septic-tank systems of the L. R. S. type, with underground filtration properly constructed. Infected wells in these villages were closed. The mill villages are no longer a problem from a sanitary standpoint.

*Control of milk supplies.*—When service operations commenced, milk was scarce, high priced, and of a poor quality, both bacteriologically and chemically. On recommendations of the service, this milk was excluded from the camp. There were 10 small dairy farms supplying Spartanburg, no one of which was in sanitary condition. In addition, there were over 600 cows in the city, part of the milk of more than one-half of these being sold. Under State regulations promulgated in January, all milk sold in extra-cantonment zones was required to be pasteurized. Dairymen gradually began pasteurizing their milk, and recently the camp has commenced to use the milk under a recommendation of the service. A supplemental supply of milk has been received from North Carolina, and at present the amount of milk being used has been practically doubled. Systematic inspection of ice cream is carried on.

*Control of food supplies.*—Previous to the establishment of Camp Wadsworth there had been no inspection of food-handling places. Conditions were so bad that the Army instituted inspection before the service station was established. The service took over this inspection coincident with the promulgation of the State board of health regulations in January. These provided a method of certification. Monthly permits to sell foodstuffs at the camp were issued to dealers who were certified by the service and desired the permits. Thus indiscriminate peddling in the camp was stopped. At the end of the fiscal year the large majority of all food places in the zone were in very good condition. During the year 2,564 food places were inspected; 65 orders for the sterilization of utensils, 21 for sanitary closets, 130 for screens, and 25 for improved sanitation in general were issued; 1,657 medical-inspection certificates were issued; 213 conditional certificates were issued; and 470 cattle were tested for tuberculosis.

*Medical inspection of schools.*—During 1917 the service made an intensive study of schools in this vicinity. As a result a form of school inspection was undertaken by the city medical society. As the best results could not be obtained in this way, the service inaugurated a thorough inspection system. During the year 1,364 chil-

dren were examined, 790 were found defective and recommended for treatment and 867 were vaccinated. In addition the nurses made 833 visits to homes of school children.

*Public-health nursing.*—An immense amount of work has been accomplished, with excellent results, in this field. The nurses made 679 nursing visits, 2,209 instruction visits, 2,693 social-service visits, and 1,784 business visits. Nine hundred and seven cases of communicable diseases were seen.

*Laboratory.*—Laboratory facilities at the pellagra hospital operated by the service at Spartanburg were available for the extra-cantonment zone work. Routine clinical work was carried out in addition to the routine examinations. During the year 1,958 examinations were made.

*Control of communicable diseases.*—Requests were individually made to all physicians in the county of Spartanburg to report cases of diseases. Good cooperation was maintained. As a number of cases of meningitis occurred in the zone, the city was quarantined for the protection of troops, and all public assemblages were closed. This was done near the end of January and was kept up for two weeks. Thereafter only one case of the disease occurred. Search for carriers was made systematically.

*Control of venereal diseases.*—After the passage of a venereal-disease control law by the State, active steps were taken to meet the problem presented by these diseases. Separate clinics were installed for white and colored patients. In addition, arrangements were made for a clinic for examination and treatment in the jails. The clinics opened the last of May, and by the end of the fiscal year 83 cases had been treated, of which 70 were under treatment at that time.

*General sanitation.*—A systematic house-to-house inspection was made of sanitary conditions in the city of Spartanburg. The city health officer placed the enforcement of ordinances relating to general sanitation into the hands of the service. On recommendation of the service sewer extensions were carried out, authorized by a bond issue previously voted by the city, and water lines were extended so that both would be available. An ordinance was passed compelling connections with sewers whenever available. Other ordinances for the enforcement of sanitary conditions were passed. In April the city health officer resigned and the service began to exercise the functions of that office, which greatly enlarged the work relating to the general sanitation of the city. A total of 25,230 visits in regard to closets, garbage disposal, stables wells, etc., were made and 6,989 notices were sent out.

#### CAMP WHEELER ZONE, MACON, GA.

Extra-cantonment sanitation work was commenced at Camp Wheeler on September 8, 1917. Camp Wheeler is located on high, rolling ground, about 1 mile from the Ocmulgee River and approximately 3 miles east of Macon. The officer in charge of the service work was made acting health officer of Macon, and all service representatives were made deputy county health officials of Bibb County. The Red Cross assisted in the work.

*Malaria control.*—During the fiscal year the control of mosquito breeding for a distance of 1 mile about Camp Wheeler was commenced and about 95 per cent completed. Malaria control in other parts of Bibb County likely to affect the soldiers at Camp Wheeler was commenced about June 15, 1918. The total drainage operations accomplished in the fiscal year covered an area of 15.75 square miles. In all, 29,850 feet of natural channels were improved, 151,661 feet of new ditches were built, and work was done on lake edges to a total of 21,155 feet. Several channels were excavated by means of explosives. Maintenance work includes inspection, oiling, cleaning, and construction of small ditches. In addition, outlying parts of the area are patrolled to discover breeding places which may have been overlooked by the maintenance organization.

*Rural sanitation.*—The 5-mile zone around Camp Wheeler was utilized as a demonstration in rural sanitation, and by the end of the fiscal year three-fourths of the homes in the area had been supplied with sanitary privies. In addition all dairies supplying Macon and Camp Wheeler with milk have had sanitary privies installed, and some work was done in Walden, Lizella, and Holton districts. In the course of the work 521 homes were canvassed and surveyed. By the end of the fiscal year 455 double-compartmented concrete vaults and three Kentucky modifications of the L. R. S. privy had been installed.

*Control of milk supply.*—Following extended inspections and laboratory tests, definite rules and regulations for dairies and milk handlers were drawn up and placed in operation. Sanitary conditions at dairies have improved markedly and a greatly improved quality of milk has been produced. About 80 per cent of the milk supply, exclusive of that from privately owned cows, is pasteurized, whereas only 10 per cent was being pasteurized when the service took charge. A few dairies still maintain retail routes in Macon and sell raw milk; the retail trade, however, is slowly passing to a co-operative milk depot, where the milk is pasteurized. There are between 700 and 1,000 privately owned cows. In June supervision was commenced of all persons selling milk in any quantity.

*Control of food supplies.*—General survey of premises where food-stuffs are handled was made in the fall of 1917. In general, sanitary conditions were bad. Immediate steps were taken to have screens or fans provided to eliminate flies, adequate toilet facilities were installed, and proper provisions made for the cleaning of utensils and the hands of employees. Hotels, drug stores, bakeries, dining rooms, lunch counters, and other places serving food direct to the consumer were compelled to provide proper means of sterilization of utensils. Physical examinations of persons handling foodstuffs have been made, special attention being given to typhoid and malaria carriers and to cases with tuberculosis. About 1,000 had been examined by the end of the fiscal year. Soldiers are not allowed to be served food at places not certified by the service. About 90 per cent of places have been certified.

*Medical inspection of schools.*—School nursing and hygiene was instituted in January, 1918, with a search for carriers of meningitis during a small epidemic of that disease. Physical examinations have been made where necessary.



*Public health nursing.*—The total nursing staff at the end of the fiscal year amounted to 13. The experience of the station tends to show that the nursing staff has done more to control communicable disease than has any other agency under the station. The work of the nurses has included general district visiting, tuberculosis nursing, school nursing, infant welfare, visiting in mill villages, emergency communicable-disease control, and venereal-disease clinic work. During the spring of 1918 smallpox became alarmingly prevalent among the negro population. The nurses were thrown into the work of vaccinating school children and case contacts, the result of which was the disappearance of this disease in a remarkably short space of time.

Assistance has been furnished to the baby-welfare league of Macon, and a colored baby welfare league has been organized. Each mill village now has its infant-welfare station.

*Laboratory.*—An adequate laboratory has been established.

*Control of communicable diseases.*—In this zone the establishment of adequate vital statistic and morbidity records was a step easily accomplished. Special efforts have been placed on such work in Macon. The station has secured sufficient authority to control all infected persons, whether cases of disease or carriers. With the help of the public health nursing force measures have been taken to control communicable diseases in as great a degree as possible.

*Control of venereal diseases.*—A venereal-disease clinic was established in February, 1918, and from that time on all assistance possible was rendered to the Army authorities in the control of venereal disease in the zone surrounding Camp Wheeler. Macon passed ordinances prescribing a severe penalty for immoral conduct and giving the health officer wide powers in the control and quarantine of persons infected with venereal diseases.

The clinic treats, in addition to voluntary applicants, all persons arrested under the vice ordinance who are found infected, many prisoners arrested on other charges, and other persons ordered to the clinic under the venereal-disease ordinance. Information as to cases is received from physicians, druggists, and the records of the local draft boards of persons claiming disability or found infected upon examination. Macon has established a detention camp for women convicted under the vice ordinance or found infected with venereal disease.

Cases of venereal diseases at Camp Wheeler contracted in and about Macon have steadily decreased since the establishment of the camp.

*General sanitation.*—A general survey of sanitary conditions in Macon was made, including a systematic house-to-house inspection. Particular attention was paid to plumbing arrangements, privies, wells, accumulation of stagnant water, stables, accumulation of refuse, etc. The refuse and garbage collection service, which had been poor, was practically taken over by the sanitary force of the service in June, 1918. Strict supervision of barber shops has been maintained, and 95 per cent of these places have been certified to as complying with the sanitation regulations. By the end of the fiscal year 369 sewer connections had been made on the insistence of the service, and an additional 105 connections were in process of installation. Of the

4,000 open privies in Macon, 1,088 have been reconstructed to become type A (fly-tight box with a metal can); but, since the administration has not installed a city scavenger system, the construction of such privies is not now being encouraged. All of the cases of typhoid fever developing up to June 30 were in unsewered parts of the city. Fly breeding is very general in the city, and attempts have been made to secure the use of fly-proof receptacles for manure in stables. During the year 18,316 sanitary inspections were made.

#### PARK AVIATION FIELD, MILLINGTON, TENN.

Park Aviation Field is a one-unit aviation flying field located at Millington, Tenn., about 20 miles northeast of Memphis. On December 1, 1917, Asst. Surg. L. L. Williams, of the United States Public Health Service, was detailed there for duty in order to carry out public-health measures for the protection of the men in training. It was decided that antimalarial activities was the greatest problem and work was begun with this in view. In previous years it was estimated that about 50 per cent of the sickness in this city was due to malaria. After the zone about Park Field had been completely drained, a total of 32 miles of ditching having been done up to June 30, which practically completed the active work, only three cases had been reported in the town and two cases in the camp.

Valuable assistance was received from Shelby County and the Memphis Chamber of Commerce.

At this time future operations will be confined to maintenance and oiling of breeding places which it is not feasible to drain.

## MARITIME QUARANTINE.

During the fiscal year ended June 30, 1918, service operations included, as in former years, the enforcement of the United States quarantine laws and regulations providing measures to be undertaken for the prevention of the introduction of the various quarantinable diseases. In addition to these duties officers in charge of quarantine stations were charged with the supervision of the repair and preservation of stationary construction and floating equipment.

At the various national quarantine stations on the mainland of the United States there were inspected 10,755 vessels and 579,154 passengers and crew. At foreign and insular ports service officers inspected 5,850 vessels and supervised the fumigation of 1,845 vessels. For the destruction of rats and mosquitoes on vessels at the mainland stations 1,108 ships were fumigated with cyanide gas and 1,101 vessels with sulphur dioxide. The grand total of passengers and crew inspected was 1,129,262, and of vessels fumigated, 3,954.

### EXPANSION OF QUARANTINE ADMINISTRATION.

In September, 1917, the President by an Executive order placed the control of the quarantine administration of the Virgin Islands under the Secretary of the Treasury, the quarantine functions to be performed by officers of the Public Health Service.

As a service officer at that time was acting as chief quarantine officer for the Virgin Islands, with station at St. Thomas, the Executive order therefore caused but little change in the existing situation.

The Executive order was as follows:

#### EXECUTIVE ORDER.

Whereas an act of Congress approved June 19, 1906, provides "that the Secretary of the Treasury shall have the control, direction, and management of all quarantine stations, grounds, and anchorages established by authority of the United States \* \* \*"

Now, therefore, I, WOODROW WILSON, President of the United States, by virtue of the authority in me vested, and pursuant to section 1 of the act approved March 3, 1917, entitled "An act to provide a temporary government for the West Indies Islands, acquired by the United States from Denmark, etc.," do hereby order that the provisions of the act of Congress approved February 15, 1893, entitled "An act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service," and all rules and regulations heretofore prescribed by the Secretary of the Treasury under this act are to be given full force and effect in the islands of St. Thomas, St. Croix, and St. John, West Indies, and all public property of the former government of the Virgin Islands, ceded heretofore to the United States, consisting of quarantine reservations, buildings, wharves, docks connected therewith, and equipment, be, and hereby are, taken for uses and purposes of the United States, and the Secretary of the Treasury, through the Surgeon General of the Public Health Service, is hereby charged with all administrative duties relating to said quarantine service, and the Secretary of the Treasury shall have estimates prepared by the Surgeon

General of the Public Health Service and submitted to Congress for an appropriation for the maintenance of said quarantine service, and securing of reservations where necessary, and additional facilities for the proper enforcement of quarantine preventive measures.

WOODROW WILSON.

THE WHITE HOUSE.

27 September, 1917.

(No. 2717.)

The New York quarantine station is administered by a service officer appointed by the governor of New York for that purpose, but the station is under State control and the transfer to national control is still pending. The New York Legislature has signified its willingness to transfer the station to the Government in a joint resolution dated February 15, 1917. An item for the purchase of this station was inserted in the estimates of the sundry civil bill of 1918, but failed to receive favorable action on the part of Congress.

On April 22, 1918, the service assumed control and operation of the Baltimore quarantine station in accordance with the terms of a lease between the city of Baltimore and the National Government. Circumstances developed in the early part of April which prevented the city authorities from effectively carrying out the quarantine functions, and request was made by the mayor of the city for the Public Health Service to take charge of the station. A joint appraisal of this property has been made by representatives of the city of Baltimore and representatives from the Treasury Department, and it appears probable that Congress will favorably consider an appropriation to reimburse the city of Baltimore for the station and its equipment.

During the year Congress appropriated \$544,000 for increased quarantine facilities at the ports of Boston, Philadelphia (Reedy Island), Norfolk, and Savannah.

The plans for Norfolk contemplate the construction of a quarantine station at Craney Island with accommodations and equipment for detaining and treating 1,800 persons. The buildings will include barracks, mess halls, officers' quarters, laundry, hospital, and a central heating plant. At Boston it is estimated that the station capacity will be increased from 600 to 1,800. Detention capacity at Reedy Island will be more than doubled, and a similar enlargement of the station at Savannah is also provided for. It is planned to make the station at Savannah the quarantine station so far as detention of persons may be required for the entire south Atlantic coast.

The National Government now owns and operates 62 quarantine stations on the mainland of the United States. In the Philippine Islands, Hawaiian Islands, Porto Rico, and the Virgin Islands 26 stations are administered by officers of the United States Public Health Service. Of the total, 42 have detention facilities or floating equipment and 46 have facilities for the conduct of inspections only.

#### GENERAL PREVALENCE OF QUARANTINABLE DISEASES.

Plague, yellow fever, cholera, typhus, and smallpox have prevailed in countries having intimate commercial and traffic relations with the United States, and each of these infections has constituted a potential menace to the sanitary condition of this country.

*Cholera.*—Cholera was chiefly reported in the Orient, prevailing in epidemic form in India, the Malay Islands, Persia, and Turkey. From the information received it appeared that the disease was prevalent in epidemic form in various parts of Russia, especially the larger cities, but on account of the present commercial isolation of that country and the restriction of outward travel, the situation caused no special concern. In the latter part of the fiscal year the infection was reported at Stockholm, being transported thereto from Russia. Special instructions were issued to quarantine officers setting forth the course to be taken to prevent the introduction of disease on vessels from Stockholm.

*Plague.*—Plague was reported as present in practically every section of the globe. The infection continues to prevail in epidemic form on the west coast of South America, particularly in the city of Guayaquil. The disease is pretty well scattered throughout the Republic of Ecuador and also in the Republic of Peru. In Brazil the infection was reported present at Pernambuco and at Rio de Janeiro.

A small outbreak was also reported in Venezuela near Caracas, but apparently remained confined to that area and did not extend to the seacoast. The West Indian Islands apparently remained free from infection.

The results of rodent autopsies in the British Isles were reported as negative for plague, but from time to time cases of human and rodent plague were reported from various British ports as occurring on vessels arriving from India. In all instances preventive measures were stated to have been taken, involving isolation of the cases and fumigation of the vessels for rodent destruction. The general circumstances surrounding these cases of ship-born plague indicated a progressive epizootic amongst the rats during the course of the voyage, the crew being attacked by the disease several weeks after the departure of the vessel from the original Indian port.

The accumulated evidence suggests the danger of plague transmission from India to various ports of the world as covering a period of several weeks—possibly several months when the conditions are suitable for the perpetuation of the infection amongst the rodents on board. The discovery of infected rodents on two vessels at New Orleans, reported in the previous annual report, rather emphasizes the possibilities of such extension. The two vessels mentioned had sailed from an Indian port some four or five months prior to fumigation at New Orleans.

Plague infection continued to be reported during the year from the island of Hawaii, presumably a flare-up of the infection from the residual focus at that place.

During the latter part of the fiscal year there was a sharp increase both in rodent and in human plague at Hongkong. Measures for preventing the spread of the infection to American ports included not only the fumigation of vessels but also a systematic fumigation of all harbor lighters used in transporting cargo to vessels.

Reports from Italy indicate that plague infection has been rather firmly implanted among the rodents in Naples, although no human plague has been reported from that port.

Plague was also reported in epidemic proportion in Egypt, Indo-China, and in Java.

*Yellow fever.*—Yellow-fever infection was reported during the year from Mexico, Guayaquil, Guatemala, Ecuador, and Brazil.

From Mexico the infection was reported present in Merida in April, 1918. While the infection has never been reported officially by the Mexican Government, consular reports indicate widespread dissemination of the disease on the west coast of Mexico. Cases were reported from Acapulco, Tapachula, and Manzanillo.

In the spring of 1918 a rather widespread epidemic of yellow fever appeared in the western part of Guatemala. Although the disease was not announced until June, subsequent investigation developed that an early case was known to exist in the town of Ayutla in February, 1918, in the person of a traveler who recently had come from Tapachula, Mexico. From Ayutla the disease spread along the route of the railroad to various towns near the western coast of Guatemala.

A large number of cases were reported from the town of Retalhuleu and on request from the bureau, the State Department directed the American minister at Guatemala City to take up the subject of preventive measures with the Guatemalan Government, to the end that some system of quarantine be established in the noninfectible region (noninfectible because of its altitude and freedom from *stegomyia*), so that persons traveling from the west coast to the east coast should be detained through the period of incubation, and also that all cars passing from the west to the east coast should be fumigated in Guatemala City for the destruction of mosquitoes. These suggestions were favorably acted upon by the Guatemalan Government. In July, 1918, tender of assistance to the Guatemalan Government in combating the spread of disease was made by the International Health Board and Senior Surg. J. H. White was sent to Guatemala, to cooperate and supervise the eradication measures instituted through the office of the International Health Board. The measures adopted have apparently been successful, since there was no report of occurrence of the disease on the Atlantic coast of Guatemala.

Service representatives were stationed at Tampico, Tuxpan, Vera Cruz, Puerto Mexico, Progreso, and Salina Cruz for the purpose of furnishing the bureau information as to the sanitary condition of those ports, and for the supervision of such quarantine measures as might be required against vessels destined for ports of the United States or its possessions. A service representative was also stationed at Puerto Barrios, Guatemala.

Yellow fever was reported throughout the summer of 1918 in Bahia, Brazil, although only a comparatively small number of persons seems to have been infected.

As in previous years yellow fever was reported in epidemic form in Guayaquil. Practically no effective measures seem to have been taken for its control at that place.

In the latter part of the year 1917 yellow fever was reported as prevalent in the town of Coro. This small community lies to the eastward of the Gulf of Maracaibo and some few miles inland, but connected by rail communication with the port of La Vela de Coro. Investigation indicated that yellow fever had existed in the vicinity for at least three or four years, although previously unreported.

*Smallpox.*—Smallpox was reported in most of the ports of the world having commercial relations with the United States, but the chief menace was caused by the prevalence of a very virulent type of the infection in Mexico. Vaccination was performed at the various border quarantine stations against persons coming from Mexico who did not present evidence of immunity, either through a recent attack of the disease or a recent successful vaccination. The vaccination requirements applied not only to persons from the interior of Mexico but also to local travelers. At various national quarantine stations on the Mexican border there were vaccinated during the fiscal year some 47,196 persons.

At the Eagle Pass quarantine station 36 persons were refused admission to the country because of a recent attack of smallpox, they being still in an infectious condition. Despite all precautionary measures, however, during the winter of 1917-18 a rather serious epidemic of smallpox appeared in Eagle Pass. In all, there were about 150 cases.

The Public Health Service assisted the local authorities in combating this epidemic by loaning to them a supply of tents and camp equipment. This outbreak of smallpox was not traceable to anyone coming directly from Mexico through Piedras Negras. Several cases entered Eagle Pass from interior points of Texas. Some crossed from Mexico into Texas at unguarded points above and below Eagle Pass. The majority of the cases, however, were residents of Eagle Pass. A rather comprehensive study of the outbreak was made by Asst. Surg. Eskey and his report was published in the Public Health Reports.

*Typhus fever.*—Typhus fever was reported prevalent in practically every country in the world. The greatest ravages seem to have been in Russia—especially in Poland, where 2,500 cases were reported from Warsaw alone. While the infection continued present in Mexico, it appears to have greatly subsided in that country, probably due to the fact that during the past two or three years most of the infectible material had been used up, the majority of persons not possessing immunity having been attacked. During the past year there have been no cases of typhus reported as having entered the United States from Mexico.

Preventive measures directed against incoming travelers from Mexico were enforced at all of the national quarantine stations along the border in the same manner as in the previous year. Details as to measures in force for preventing the introduction of typhus from Mexico were fully set forth in the last annual report and will not be repeated in this report. In the magnitude of the work and technique employed there was practically no variation.

#### QUARANTINE OPERATIONS ALONG THE MEXICAN BORDER.

At El Paso, Laredo, Eagle Pass and Brownsville, which are the chief points of entry along the Texas-Mexican border, there were maintained well-equipped quarantine plants, containing steam disinfecting cylinders, cyanide gas chambers, and bathing facilities. At Hidalgo and Rio Grande City, the equipment was adequate but less elaborate than at the preceding points. These plants were in daily

operation and preventive measures were applied against incoming travelers for the prevention of the introduction of typhus and of smallpox, the two quarantinable diseases which were prevalent in Mexico. For the prevention of the introduction of typhus, the policy of the service, as in the previous year, contemplated the treatment of incoming travelers for the purpose of rendering them and their personal effects vermin free. No attempt was made to establish a 12-day detention for the detection of cases in the incubative period of the disease.

The details of the method of delousing travelers was the same as those described in the previous annual report. On account of the increased restrictions in the new immigration act, including the illiteracy test and the head tax, there was a material curtailment in the number of immigrants, and the passport requirements of the United States Government further decreased the amount of travel, so that the number of persons treated at the quarantine stations was very materially smaller than that of the preceding year.

The antityphus measures instituted were entirely successful, as no case of this disease was reported within the United States during the fiscal year. Practically the only event of importance on the border from a quarantine standpoint was an epidemic of smallpox in Eagle Pass.

*Statistical data of quarantine transactions of the Texas-Mexican border points for the fiscal year ending June 30, 1918.*

Title.	Brownsville.	El Paso.	Eagle Pass.	Hidalgo.	Laredo.	Rio Grande City.	Total.
Number inspected from interior Mexico.....	4,607	24,339	5,321	3,151	22,280	1,638	61,336
Number local passengers inspected.....	438,223	1,723,464	513,763	.....	708,566	6,988	3,391,004
Total number persons disinfected.....	588	99,956	33,713	398	4,610	308	139,573
Total number persons passed without treatment.....	.....	.....	485,371	.....	724,756	.....	.....
Total number persons vaccinated.....	5,013	16,580	6,047	1,370	17,197	989	47,196
Total number of sick detained for observation.....	.....	.....	.....	.....	.....	.....	.....
Total number of sick refused admission.....	.....	58	78	.....	25	12	173
Total number pieces baggage disinfected.....	4,327	6,329	34,710	.....	24,679	.....	70,045
Number of cases of typhus fever from July 1, 1917, to June 30, 1918.....	.....	.....	.....	.....	.....	.....	.....

#### DESTRUCTION OF RATS ON VESSELS.

As in former years, incoming vessels were fumigated for the purpose of destroying rats. This procedure applied not only to vessels coming direct from infected ports but also to vessels that had touched at such infected ports within the preceding four months. For the purpose of guiding quarantine officers in the uniform application of the provisions of paragraphs 111 and 112 of the United States quarantine regulations, the following bureau circular was issued:

APRIL 19, 1918.

*Medical officers in charge national quarantine stations and others concerned.*

SIR: 1. The provisions of paragraphs 111 and 112, United States quarantine regulations, shall be construed as applying to vessels from the following ports:

A. All ports in Asia, including those of the Straits Settlements, Japan, Philippine Islands, and the Malay Archipelago.



- B. All ports in Africa, including the Azores, Canary Islands, Cape Verde Islands, and Madeira.
  - C. All ports in South America, including the river ports thereof, except as otherwise indicated below.
  - D. Ports enumerated in bureau circular letter dated December 19, 1917, and any other port that may from time to time be specifically reported as plague infected.
2. The provisions of paragraphs 111 and 112, as well as those of this circular, shall apply not only to ships coming direct from but to any vessel that has been to any of the above-enumerated ports within the preceding four months which in the meantime has not been fumigated under the supervision of a service representative.

## EXEMPTIONS.

3. Vessels from South American ports that have not been alongside of wharf and have loaded with bulk cargo (such as nitrates) at anchorage may be passed without fumigation unless otherwise falling within the restrictions of paragraph 2 of this letter, i. e., have been alongside of wharf at some other plague-infected port.

4. The provisions of this circular will supersede those of bureau circular dated August 4, 1913, or any other that may be inconsistent herewith.

Respectfully,

RUPERT BLUE, *Surgeon General.*

All told, there were fumigated 3,954 vessels, 11,970 rats being recovered as the result of such fumigation. In numerous cases it was not practical to search the vessels after fumigation, so that the actual number of those destroyed far exceeded the number given. In addition to the fumigation of vessels for the destruction of rodents, fumigation was also performed for the destruction of mosquitoes, bed-bugs, and other vermin.

The fumigating agents used were sulphur dioxide and hydrocyanic-acid gas. One thousand one hundred and one vessels were fumigated by sulphur dioxide, and 1,108 were fumigated by cyanide gas.

## VIOLATION OF QUARANTINE LAWS.

During the fiscal year the department passed on 68 cases involving violation of the act of February 15, 1893, due to the failure of masters to present American consular bills of health. Of the total, 31 were dismissed without penalty because of extenuating conditions, due, in some cases, to the lack of an American consular representative at the foreign port of departure, and, in other instances due to the diversion of the vessel from the original port of destination by orders received on the high seas after leaving the port of departure. In 37 cases mitigated penalties were imposed, the total amount of fines collected being \$1,975.

## ASSISTANCE EXTENDED TO OTHER GOVERNMENT SERVICES.

During the year part of the facilities at San Diego quarantine station and Delaware Breakwater station continued to be utilized by the naval forces as in the previous year.

The occupation of Fishermans Island by the War Department continued in force, and in return the War Department granted to the Treasury Department a revocable license for the use of Craney Island as a quarantine reservation. A bill has been introduced in Congress for the transfer of Craney Island to the Treasury Department and Fishermans Island to the War Department.

Housing facilities at Angel Island quarantine station were extended for a short period to the Department of Labor for quartering interned aliens. Upon an outbreak of diphtheria in the naval forces at Boston some two or three hundred sailors, including both patients and carriers, were received and taken care of at Boston quarantine station. Later on the station was again utilized for the care and treatment of cases of influenza in the naval forces. Detention facilities in the San Juan quarantine station were utilized for a short time in the housing of a navy detachment. At various quarantine stations of the service assistance was rendered to neighboring military forces in sterilizing personal effects, bedding, etc. Part of the detention quarters at Tampa Bay quarantine was loaned to the Navy for the accommodation of the naval patrol forces in that neighborhood. Assistance was also extended to the Immigration Service in detailing officers for the medical supervision of aliens at internment camps.

*Transactions at national quarantine stations for the fiscal year ended June 30, 1918.*

Stations.	Ves-sels in-spected.	Ves-sels fumigated.	Passen-gers and crews in-spected.	Stations.	Ves-sels in-spected.	Ves-sels fumigated.	Passen-gers and crews in-spected.
Alexandria.....				Monterey.....			
Baltimore.....	111	11	5,134	Morgan City (Atcha-falaya).....			
Beaufort.....				New Orleans quarantine.....	1,636	60	72,332
Bellingham, Wash.....				New Orleans city.....		596	
Biscayne Bay.....	127	12	2,561	Newport.....	3		97
Bocagrande.....	9		178	Nome, Alaska.....	5		
Boston.....	465	106	27,925	Pascagoula.....	73	19	641
Brownsville.....	(2)		24,607	Pensacola.....	187	28	2,846
Brunswick.....	28	7	1,091	Perth Amboy.....	75	19	1,718
Cape Charles.....	1,705	113	80,833	Port Angeles.....	4		66
Cape Fear.....	25	14	631	Port San Luis.....	24		869
Cedar Keys.....				Portland, Me.....	109	4	7,641
Charleston.....	130	18	4,631	Port Royal.....			
Columbia River.....	22	3	368	Port Townsend.....	335	267	36,607
Coos Bay.....				Providence.....	26	2	2,650
Cumberland Sound.....	30	1	823	Provincetown.....			
Darien.....	1		6	Reedy Island.....	884	44	34,729
Delaware Breakwater.....	48		801	Rio Grande city, Tex.....	(2)		21,638
Delaware River (Phila-delphia).....		117		San Diego.....	555	1	5,539
Eagle Pass.....	(2)		25,321	San Francisco.....	776	458	90,028
Eastport.....	429	1	25,917	Santa Barbara (Los Angeles).....			
El Paso.....	(2)		24,339	San Pedro (Los Angeles).....	137	8	4,615
Eureka.....	4		27	Savannah.....	126	18	4,017
Fort Bragg.....				South Bend.....	1		8
Galveston.....	458	22	15,562	St. Andrews.....	39	8	232
Georgetown.....	3		20	St. George Sound.....			
Gulf.....	63	21	1,900	St. Johns River.....	170	16	2,589
Hidalgo, Tex.....	(2)		23,151	St. Josephs.....	21		140
Houquim.....	9		98	Tampa Bay.....	272	39	3,715
Key West.....	1,085	9	60,694	Washington, N. C.....			
Ketchikan.....	192		10,345				
Laredo.....	(2)		22,280				
Mobile.....	353	67	7,194	Total.....	10,755	2,109	579,154

<sup>1</sup> Apr. 22 to June 30, inclusive.

<sup>2</sup> Border station. Statistics do not include "local" travelers who, however, were subjected to cursory inspection. Through travelers were given close examination.

*Composite table of detailed transactions at maritime-quarantine stations on the mainland for the year ended June 30, 1918.*

Total inspections: <sup>1</sup>	
Vessels.....	10,755
Crew.....	392,181
Passengers.....	126,611
Total personnel inspected.....	517,818
Vessels passed on certificate of ship's medical officer.....	197

<sup>1</sup>An inclusive figure regardless of treatment or report elsewhere.

*Composite table of detailed transactions at maritime-quarantine stations on the mainland for the year ended June 30, 1918—Continued.*

## VESSELS DETAINED FOR OBSERVATION OR TREATMENT.

[Detention for purposes of inspection only not to be included.]

Nature of infection—	Yellow fever.	Rodent plague.	Human plague.	Small-pox.	Ty-phus.	Chol-era.	Lep-rosy.	Total.
Vessels from infected ports <sup>1</sup> .....	114	1,961	2	1	2	.....	.....	2,080
Infected vessels <sup>2</sup> .....	1	.....	.....	6	.....	.....	1	8
Number of cases.....	1	.....	2	6	3	.....	1	13
Number of crew detained.....	2,903	613	71	97	55	.....	1	3,740
Number of passengers detained.....	776	.....	.....	3	.....	.....	.....	779
Personnel disinfected.....	.....	.....	.....	78	3	.....	1	82
Personnel examined bacteriologically or vaccinated <sup>3</sup> .....	19	.....	2	29	.....	.....	1	51
Vessels fumigated $\begin{cases} \text{HCN} \\ \text{SO}_2 \end{cases}$ .....	14	994	.....	.....	.....	.....	.....	1,008
	22	1,075	.....	3	1	.....	.....	1,101

<sup>1</sup> Refers to vessels held for observation when from an infected or suspected port with no cases en route on arrival.

<sup>2</sup> Vessels with cases on board at arrival or reported en route.

<sup>3</sup> To also include microscopical examinations of blood, excreta, tissue, etc.

<sup>4</sup> To include vessels fumigated after passing quarantine in accordance with provisional pratique.

Number of rats destroyed on ships..... 11,970  
Rats examined..... 7,579

## REPORTS FROM NATIONAL QUARANTINE STATIONS.

Following are the summaries of the operations at the various quarantine stations:

*Alexandria, Va.*—Acting Asst. Surg. Arthur Snowden in charge.  
No transactions.

*Baltimore, Md.*—Baltimore quarantine station is located at Leading Point on west side of the Patapsco River, 7 miles distant by water from Baltimore and 9 miles by overland road. Post-office, express, and telegraphic address, Baltimore, Md.

Acting Asst. Surg. T. L. Richardson is in charge of the station, Acting Asst. Surg. J. C. Travers being assistant.

The Federal Government assumed control and operation of the Baltimore quarantine station on April 22, operating it under terms of lease between the city of Baltimore and the National Government.

Circumstances developed the early part of April which prevented the city authorities from effectively carrying out the quarantine requirements, and request was made by the mayor of the city that this service assume charge of the station.

The floating equipment of the station consists of one steam tug, 75 feet long, and a power launch, 40 feet long.

The buildings on the station include quarters for the medical officers and for the station force of attendants, a station hospital, detention barracks, and disinfecting equipment.

This station is well located for the purpose of a quarantine station, and after the completion of much-needed repairs to the station buildings, wharves, and the addition to the detention facilities will fill the purpose for which the station was intended.

In continuance of the policy followed by the city government the station hospital was utilized for the reception and care of smallpox cases developing in the vicinity. Smallpox patients are received from the city of Baltimore, from Anne Arundel County, and from

neighboring industrial plants, the Government being reimbursed for the care and treatment of these cases.

From April 22 to June 30 there were treated in the station hospital 44 cases of smallpox, all cases recovering. There was one case of leprosy confined at the station.

*Summary of transactions.<sup>1</sup>*

Vessels inspected and passed-----	111
Vessels fumigated-----	10
Number of seamen inspected-----	5,044
Number of passengers inspected-----	90

*Beaufort (S. C.) quarantine.*—Post-office and telegraphic address, Chisolm, S. C. Acting Asst. Surg. C. G. Hay. No transactions.

*Bellingham, Wash.*—Acting Asst. Surg. L. R. Markley in charge. No transactions.

*Biscayne Bay (Fla.) quarantine.*—Post-office and telegraphic address, Miami, Fla. Acting Asst. Surg. J. M. Jackson in charge.

During the year 127 vessels were inspected and 12 were fumigated for the destruction of rodents. The total number of passengers and crew inspected was 2,561.

There was a considerable decrease in travel entering at this port, due to provisions of the new immigration law barring the illiterates. During the year, however, several immigration restrictions were temporarily removed so as to permit the entrance of laborers for agricultural work. Otherwise vast crops of vegetables would have been lost for lack of labor.

The new channel and docks have not yet been completed.

*Boca Grande (Fla.) quarantine.*—Post-office and telegraphic address, Boca Grande, Fla. P. L. McAdow in charge.

This station is in charge of the custodian, P. L. McAdow, who attends to the general administration of quarantine affairs other than the inspection of incoming vessels or supervision of fumigation. The professional duties are discharged by Acting Asst. Surg. W. M. Mathews, who is notified by the custodian whenever his services are required.

During the year there were inspected nine vessels, with total personnel of 198, all of whom were crew. No quarantinable diseases were noted throughout the year.

*Boston (Mass.) quarantine.*—Post-office and telegraphic address, Gallops Island, Boston, Mass. Surg. Donald H. Currie in charge.

Surg. Donald H. Currie relieved Surg. S. B. Grubbs of the charge of the station on August 7, 1917. No other change has been made in the staff. The attendant force afloat has been increased by the addition of one deck hand and one fireman. This increase was authorized to allow the crew of the *Vigilant* hours more nearly approaching those allowed on commercial boats. The attendant force ashore has been increased by the addition of a station engineer. Difficulty has been experienced by the station in obtaining and holding competent employees, particularly in positions requiring skilled labor, and this appears to be due to the higher salaries offered in private employment.

<sup>1</sup>Apr. 22 to June 30, inclusive.

Eight additional buildings are now under construction at the station and it is expected they will be ready for occupancy during the coming winter. These buildings include one hospital, two barracks, one double barracks with dining room and kitchen attached, one bathing barracks, one detention building for cabin passengers, and a set of officers' quarters. The completion and equipment of these buildings will more than double the barrack capacity of the station and will considerably increase hospital accommodations. The new hospital will have space for 28 beds in wards and will be provided with 12 private rooms.

Extensive repairs have been made to other station buildings by the station force, including the complete interior painting of hospital buildings Nos. 6 and 9. The north side of building No. 13 has been completely repaired, and the painting of the station buildings, started two years ago, has been completed.

A new motor launch has been provided for use as a supply boat and emergency boarding boat. This boat is a 40-foot raised-deck motor cruiser and will be operated only during the summer. It is not suitable for boarding except in very calm weather, and its purchase in no sense relieves the need of a new boarding steamer at this station.

A considerable amount of minor equipment, including a new chemical fire engine, office furniture, tools, and kitchen ware has also been purchased during the year.

Quarantine operations: The quarantine transactions of the port show a slight decrease as compared with the previous fiscal year, and there has been a marked decrease in fumigations due to the clearing up of Liverpool and London as plague ports.

The fumigation of vessels with hydrocyanic-acid gas has been continued during the year, although sulphur has been used to a great extent in the holds in instances where its use would not delay the ship. Practically no changes have been made in the method of fumigating with hydrocyanic-acid gas in use at the station, but the use of a canvas funnel attached to the blower in clearing out holds has been abandoned, since it appears that the holds clear more quickly without this attachment.

During the past year the station has been breeding rats for the testing of ships' holds after fumigation with hydrocyanic-acid gas, and the results have been fairly satisfactory. The animals appear to breed best when provided with a fairly large pen, given sufficient food at proper intervals, and disturbed as little as possible.

Approximately 280 interned German sailors and officers were quartered at the station at the beginning of the fiscal year, together with a guard of one machine-gun company from the One hundred and first United States Regiment. The sailors were quartered in barracks and the officers in a hospital building. The guard were quartered in three of the isolation buildings and in tents. These accommodations were provided with bureau approval, at the request of the United States Immigration Service. These alien enemies remained at the station until October 5, 1917, although the military guard left somewhat earlier and were replaced with Immigration Service guards.

At the request of the commandant of the First Naval District the station provided subsistence and treatment for 143 enlisted men of

the Navy during February, March, and April. These men were proven carriers of meningococcus and were isolated at the station until their condition, as shown by cultures taken at five-day intervals, cleared up. They were quartered in barracks, and only such cases were admitted to hospital as required treatment for other causes.

At the request of the commandant of the Boston Navy Yard the station treated the mattresses, carpets, and bedding from all of the interned German liners seized at this port, with hydrocyanic-acid gas in vacuum, for the destruction of vermin. There were approximately 200 tons of this material and the work covered a period of several months.

Overcoats, bedding, and other materials have been disinfected by steam and treated with hydrocyanic-acid gas in vacuum for the destruction of vermin for the various Army posts in the harbor, at the request of the post medical officers, and the station laboratory is placed at the disposal of Army medical officers at harbor posts having no laboratory facilities.

Thirteen naval vessels were fumigated for the destruction of vermin during the fiscal year 1918.

The station desires to acknowledge the receipt of important assistance from the commander of the Boston naval section during the past year. Through the courtesy of this officer the station has been provided with a boat and crew for boarding purposes at such times as the *Vigilant* was out of commission through accident or for necessary repairs. This action has saved the service a very considerable expense for boat hire and has materially assisted the station in emergencies which might otherwise have delayed shipping.

By arrangement with the service officers detailed for the medical inspection of arriving aliens the station will receive and care for cases of nonquarantinable contagious diseases for the Immigration Service at this port.

By arrangement with the Boston health department the station will receive any contagious cases they desire treated here.

By arrangement with the United States marine hospital at Chelsea the station receives and cares for any acute contagious cases from that hospital and will remove such cases from ships on arrival at the port, provided they are entitled to treatment under the service regulations.

Transactions: During the fiscal year ended June 30, 1918, a total of 465 vessels entered quarantine, as follows:

Steamers	433
Motor ship	1
Schooners	14
Barks	10
Ships	7

Of this number 92 required fumigation and were treated as follows:

Fumigation with sulphur	45
Fumigation with hydrocyanic-acid gas	18
Fumigation with hydrocyanic-acid gas and sulphur	29

In addition to the above, 13 vessels were fumigated for the Navy Department and 1 for the Shipping Board.

The above vessels carried crews numbering 22,596 and 5,329 passengers, making the total personnel inspected 27,925.

One naval patrol cruiser was detained seven days at the request of the Navy Department following the removal of a case of scarlet fever. The crew were provided with quarters ashore a portion of the time. The vessel was fumigated with formaldehyde gas, all bedding and clothing disinfected by steam, and the quarters and furniture thoroughly scrubbed.

One case of leprosy was removed from a steamship arriving from a British port. The diagnosis was confirmed by bacteriological examination, and the patient was detained at the station and later placed aboard the same ship outward bound.

The following cases were treated in hospital:

Syphilis <sup>1</sup> .....	1
Pneumonia <sup>1</sup> .....	1
Typhoid.....	1
Observation for plague.....	2
Measles.....	3
Leprosy.....	1
Meningococcus carriers (in barracks).....	141

Following diagnosis of a case of typhoid fever among the interned Germans vaccination against typhoid fever was made compulsory. It had previously been advised by the medical officer in charge, but the Germans did not desire it and the Immigration Service did not desire to enforce it. Typhoid and smallpox vaccination was also furnished the machine gun company stationed on the island as well as the Immigration Service guards.

Out-patient treatment was furnished the interned Germans and their guard at the station, but hospital cases other than contagious were transferred to the marine hospital when possible.

*Brownsville, Tex.*—Acting Asst. Surg. G. F. Fairbanks in charge. Quarantine measures against the introduction of contagious diseases from Mexico have continued along same line as indicated in the last annual report and have proved very effective in that this country has not had a single case of smallpox during the year and has never had a case of typhus fever. There has been no reported case of typhus on the Mexican side of the river in this vicinity, but there have been a considerable number of smallpox cases.

On May 1, 1917, the disinfecting plant was opened and has proven to be of great value.

#### *Transactions.*

Vaccinations against smallpox performed.....	5, 013
Pieces baggage inspected and fumigated.....	4, 327
Persons bathed and cleaned.....	588
Persons entered at the port (majority daily passengers back and forth).....	442, 830
New aliens entered.....	4, 607

The officers of the Department of Agriculture have requested the fumigation of all baggage possible in order to assist in keeping out the pink boll-worm moth which sometimes hides in personal baggage.

Assistance rendered to the United States Coast Guard Service included the physical examination of two men and one pilot, 22 treatments for sick and injured surfmen, instructing them in taking finger prints on metal tags, and several examinations of urine and blood.

<sup>1</sup>Meningococcus carriers.

*Brunswick (Ga.) quarantine.*—Acting Asst. Surg. R. E. L. Burford in charge.

During the year 4 vessels were spoken and passed, 14 steamers and 8 sailing vessels were inspected and passed; 3 steamers and 4 sailing vessels were inspected, fumigated, and passed. There were 926 crew on steamers, 95 crew on sailing vessels, 70 shipwrecked seamen as passengers on one steamer. No vessel was quarantined and no quarantinable disease was found aboard any vessel in port.

*Cape Charles quarantine.*—Post-office and telegraphic address, Fort Monroe, Va. Surg. H. McG. Robertson in charge.

In contrast to the previous year, there has been a considerable decrease in the number of vessels subject to quarantine inspection entering this port. This was chiefly due to war conditions, especially the prolonged retention in port of vessels of certain neutral countries.

Transactions for the last two months of the fiscal year, however, indicate an increase. There were fewer number of vessels fumigated than in former years, chiefly due to the fact that a majority of vessels arriving at Norfolk come from European ports, and European ports that are considered to be plague free.

During the year the War Department continued to occupy Fishermans Island. Only one attendant remains there to look after service property. It has been definitely determined by the department to turn over this reservation to the Army and to establish detention facilities at Craney Island, in Norfolk Harbor. On account of its inaccessibility, Fishermans Island for a number of years has not served the purpose for which it was originally intended.

During the year Congress made an appropriation for the construction of a new station at Craney Island, and plans are under way for the construction of the necessary buildings at that place.

The quarantine hulk *Chase*, formerly anchored off Old Point, has been permanently tied up to piles near the Chesapeake and Ohio Railway, and arrangements are completed for the installation of telephone and electric lights and a more modern water-distribution system. The *Chase* will be connected with land approaches by means of a gangway, and with this change will be more serviceable than formerly.

Quarters for the medical officer in charge of the station were completed during the month of June, 1918. The house is now occupied.

In September, 1917, the Immigration Service stationed an inspector at Old Point Comfort. Since that time all alien seamen have been given a medical examination by the officers attached to this station.

Heretofore, the operation of this station has been more or less handicapped by lack of a suitable boarding boat, but it is expected that the quarantine vessel *Murray*, transferred from Providence, will admirably fill the needs of this station.

No quarantinable diseases have been encountered during the year.

Seventeen hundred and five vessels were inspected, carrying 70,211 crews and 10,622 passengers.

One hundred and three vessels were fumigated for the destruction of rodents. In those vessels that were searched, 1,520 dead rats were discovered.

*Cape Fear quarantine station.*—Post-office and telegraphic address, Southport, N. C. Acting Asst. Surg. D. J. Watson in charge.



Transactions at this station were similar to those of last year, no quarantinable diseases being noted and nothing of an eventful nature having occurred.

Twenty-five vessels were inspected and passed, carrying a total of 631 persons, practically all crews.

Fourteen vessels were fumigated for the destruction of rats.

In addition to the regular quarantine work, assistance was extended to the Army post at Fort Caswell, N. C., in disinfecting bedding belonging to the post personnel. This work was done at the request of the commanding officer.

*Cedar Keys (Fla.) quarantine.*—Acting Asst. Surg. J. W. Turner in charge. No transactions.

*Charleston, S. C.*—Surg. H. M. Manning in charge.

The character of shipping entering this port from foreign ports has remained the same as in previous years, most of the vessels bringing nitrate and other materials used in the manufacture of fertilizer.

In addition a number of ships called at this port for coal.

The construction of large terminals indicate that there will be a material increase in the shipping activities at this port.

All told, 130 vessels were inspected, carrying 3,951 crew and 680 passengers. Eighteen vessels were fumigated for rodent destruction.

*Columbia River quarantine.*—Post-office and telegraphic address, Astoria, Oreg. Acting Asst. Surg. Jay Tuttle in charge.

Quarantine operations at this port during the year suffered a further decrease over that of the previous year. Twenty-two vessels were inspected and passed and three vessels fumigated for rodent destruction.

No quarantinable diseases were encountered, and there was no eventful occurrence.

Although the number of vessels entering this port during the past two or three years has shown a continued decrease, it is probable that the deepening of the channel of the Columbia River bar, permitting the entry of vessels of 40-foot depth, and the material enlargement of the docks and equipment at Portland, will increase the shipping activities of this port.

*Coos Bay (Oreg.) quarantine.*—Post-office and telegraphic address, Northbend, Oreg. Acting Asst. Surg. Gilbert E. Anderson in charge. No transactions.

*Cumberland Sound quarantine.*—Post office and telegraphic address, Fernandina, Fla. Acting Asst. Surg. J. Louis Horsey in charge.

No sickness of quarantinable nature was found in the inspection of crew and passengers.

Thirty vessels were inspected at the station during the year, with a total of 803 crews and 20 passengers.

Only one vessel was fumigated, that for the destruction of rodents.

*Darien (Ga.) quarantine.*—Acting Asst. Surg. P. S. Clark in charge.

During the year one vessel was inspected and passed, with a crew of six persons.

*Delaware Breakwater (Del.) quarantine.*—Post office and telegraphic address, Lewes, Del. Acting Asst. Surg. W. P. Orr in charge. A total of 48 vessels inspected during the year, passengers and crews numbering 801. No sickness of quarantinable nature was

discovered in the personnel inspected. The total of 14 vessels were given provisional pratique subject to their fumigation at the port of destination. Vessels arrived at quarantine station merely for the purpose of receiving orders as to port of destination.

*Eagle Pass, Tex.*—Asst. Surg. C. R. Eskey, in charge, reports that the same measures for the prevention of the introduction of typhus fever from Mexico have been in effect during the past year as were reported last year. As no passenger-train service has been in operation at this port, all work has been conducted at the international footbridge.

During the past year, especially the last six months, there has been a heavy local traffic between Piedras Negras and Eagle Pass, as it has been necessary for residents of Mexico to come to Eagle Pass for most of their clothing and food. The number of passengers from interior points in Mexico has been rather small compared with former years, which is also true for the number of immigrants crossing the international bridge. Restrictions placed by the Mexican authorities upon Mexicans desiring to come to the United States for work have been so stringent that most of the laborers have had to surreptitiously ford the Rio Grande River. This arrangement is very unsatisfactory for a proper supervision of the immigrants, but, as many of them come to Eagle Pass to find work, and a considerable number are apprehended by the different agencies guarding the river, a large proportion of these illegal entrants are treated by the quarantine service before they leave for interior points in the United States.

The number of people harboring vermin, who cross from Mexico, is being steadily reduced; in fact, pediculosis vestimenti is rarely seen nowadays. Pediculosis capitis continues to be quite prevalent, as shown by the fact that over 700 males have had to have their hair clipped because of the presence of parasites.

Since July 1, 1917, there has not been a single case of typhus fever reported in this vicinity, and no notification has been received that any immigrant passing through this port has suffered from that disease.

This year the local Army medical officers have taken advantage of the disinfection plant as a means of cleaning up a large number of military prisoners before placing them in the post guardhouse, and on several occasions they have sent soldiers to the plant for treatment.

It is believed that the facilities for the disinfection of both passengers and baggage, which the service possesses at the disinfection plant, have been of inestimable value in preventing the spread of smallpox from Mexico into the United States, because there were hundreds of cases of that disease along the Mexican side of the border during this past winter.

Vaccination against smallpox of all travelers, who were not immunized, has been continued throughout the year. During the last six months revaccination was required of all persons who did not possess a well-marked scar of two years' or less duration, whereas, formerly, individuals with scars eight years old were passed.

There were over 150 cases of smallpox in Eagle Pass this winter and, as the local authorities had no means of isolating the patients, they requested that the Public Health Service loan them all of the

camp equipment stored at this station. The request was granted, and 24 tents and other articles were made available for the use of the county health officer who had charge of the isolation camp for more than six months, or until the epidemic died out.

The regulation requiring passports of all passengers from Mexico, effective November 15, 1917, has been of great aid in conducting the quarantine work, for it has enabled the inspectors to recognize all new aliens and has furnished a means of identifying the status of those crossing frequently.

The following improvements have been made at the quarantine station in the last year: Waste water is now disposed of through the Army post sewer system, instead of through means of a cesspool; the fencing has been changed, thus improving the appearance of the grounds; and a new boiler for steam sterilization has been installed so that two boilers are now available for the work.

Seventy-eight travelers were returned to Mexico because of sickness. These people were refused admittance because of the following conditions: Convalescent smallpox, 36 cases; conjunctivitis (suspectious of trachoma), 18 cases; ringworm, 12 cases; impetigo contagiosa, 4 cases; fever, 3 cases; varicella, 2 cases; scabies, 2 cases; and whooping cough, 1 case.

In accordance with department circular No. 83, dated May 16, 1917, 216 local residents were vaccinated against smallpox and 6 against typhoid fever.

Following is a summary of the quarantine transactions from July 1, 1917, to July 1, 1918:

Total number of persons inspected from the interior of Mexico	5,321
Total number of local passengers inspected	513,763
Total number of persons disinfected (deloused)	33,713
Total number of passengers passed without treatment	485,371
Total number of persons vaccinated	6,047
Total number of sick detained for observation	None.
Total number of sick refused admission	78
Number of pieces of baggage fumigated	34,710
Total number of cases of typhus since July 1, 1917	None.

*Eastport (Me.) quarantine.*—Acting Asst. Surg. John E. Brooks in charge. During the year 429 vessels were inspected and passed. These vessels carried 25,917 passengers and crew. In addition to the above vessels hundreds of small motor craft arrived daily. These small craft carry from 1 to 25 passengers. Most of these people come here to trade, but in many instances they come to take the train or steamer for points farther west.

Three cases of smallpox was found aboard one of these small craft. These cases were held in quarantine aboard until all danger had passed. The vessel was then fumigated and passed.

Seventy-five cases of smallpox were reported in this city during December, 1917, and January, 1918. Twenty cases were reported in Lubec and two in Perry. Unofficial reports have been received from time to time of cases occurring among the fishermen living on the neighboring Canadian islands. There is no doubt that a few cases have been present among these people, none of which have been reported. This is not to be wondered at as these people live many miles from a doctor, and in most cases, owing to the mild character of the disease, it has often been mistaken for chickenpox.

These cases are of especial importance to this community as the vessels engaged in the transportation of sardines and other fish products come into actual contact with these individuals.

One hundred and fifty cases of measles have been reported during the year. Six cases of typhoid have also been reported. No deaths have been reported in any of these cases. The smallpox and measles were of a mild type.

One thousand eight hundred and eighty-four persons were vaccinated against smallpox at this station; 122 of these were vaccinated twice, 3 were vaccinated three times, and 1 four times. One case was vaccinated six times without a successful take. More than 60 per cent of these vaccinations reported a successful take, the remainder were not seen after vaccination. Only two bad arms were seen among all reporting and these associated with other conditions besides the vaccination.

A great many capillary tubes of the vaccine were destroyed, owing to the rush during the first few days and to the fact that the tubes vary in size, while the opening in the rubber ejector was too large to readily force out the vaccine.

Two persons applied for typhoid serum. These persons brought serum from the laboratory of Parke Davis Co. The serum was administered. A few others have applied for typhoid serum, but as none is kept on hand they had to be refused. It was not thought advisable to order any, as the amount used would be small, and it would be almost impossible to keep any amount on hand without a great percentage of loss. The Havey & Wilson Co. are the agents of the Parke Davis Co. in this city, and they have taken the matter up with the Parke Davis Co. to have serums on hand, which they will issue on order. This will be a great convenience, as vaccines can then be secured only in the amount required.

Vaccination certificates were issued to 500 school children vaccinated at this station. The schools were visited and the children showing successful vaccinations were certified. About 150 others, vaccinated at this station, were also given certificates on application.

During the outbreak of the disease, many communications were received and answered. These letters were from persons coming to or leaving the city. Telegrams were also sent to several Army camps concerning men leaving here who had been in possible contact with the disease. In so far as can be learned no notice was ever taken of these notices. In the case of one young man, going to Camp Dix, his sister was stricken the day after he left.

Many vessels of the Naval Reserve entered this port during the last winter. As the harbor was free from ice there were often three or more of these vessels lying at the wharves at one time. A few of the personnel of these vessels applied for treatment and others would have done so had they known that a station was maintained here. Owing to full understanding of forms to be used when aid is ordered and given to sailors from the Navy records are incomplete. This will be remedied in the future.

Total number of physical examinations made during the year, 32. These were divided as follows: Merchant marine, 13; Naval Reserve, 1; inspectors of hulls and boilers, 2; Coast Guard Service, 15; Coast and Geodetic Survey, 1.

*El Paso, Tex.*—Asst. Surg. J. W. Tappan reports that during the fiscal year ended June 30, 1918, typhus-eradication operations at El Paso quarantine were continued as instituted last year.

Smallpox, mildly epidemic in the State of Chihuahua, Mexico, has been guarded against by rigid enforcement of the regulations regarding vaccination. There has been no typhus reported in El Paso or vicinity, the last case occurring in May, 1917. The city registrar of El Paso reports fewer cases of all contagious diseases, except measles, which was epidemic during the past winter. There is no doubt but that the stringent regulations at the international border, compelling persons likely to convey disease to pass through the disinfecting plant, has caused the diminution of these diseases in this area.

Residents of the neighboring city of Juarez, Mexico, were inspected at each entry into the United States and, if necessary, were required to pass through the disinfecting plant. Persons coming from the interior of Mexico conformed to the usual regulations and were vaccinated. Passengers, either "locals" from Juarez or those from the interior, who are obviously clean and are not louse-infested, are permitted to pass, after inspection and vaccination, without going through the disinfecting plant; but all immigrants corresponding to the steerage class at large ports of entry are required to bathe, have their clothing and baggage disinfected, and submit to vaccination. The working classes from Juarez, known as "locals," are required to pass through the disinfecting plant once a week. A bath certificate is issued to these and taken up at the expiration of the week, a new one being issued after disinfection.

The order issued to transportation companies January 20, 1917, directing that no Mexicans of the laboring classes or their families were to be provided with transportation unless they had a certificate showing that they had been bathed and their clothing and baggage disinfected at the disinfecting plant, and that, in addition, they had been vaccinated by a medical officer of the service, was modified in September, 1917, so that the transportation companies by establishing their own disinfecting plants were allowed, under the supervision of the service, to bathe, vaccinate, and disinfect clothing and baggage of laborers reshipping from El Paso and who had not been in Mexico. The reason for this modification was the fact that many Mexicans who had been working on the various railroads, and who had come to El Paso to reship to other points upon the same or other roads often evaded the regulation requiring them to go through the service disinfecting plant—the motive for such evasion being that frequently they were found, when interrogated by the immigration authorities, to be subject under the law to the illiteracy test and liable for the nonpayment of the \$8 head tax. These laborers were taken out of El Paso in droves clandestinely and the evasions of interstate quarantine regulations became so frequent and hard to control that, as there had been no typhus fever in El Paso since May, 1917, it was decided to allow the railroads to establish plants and delouse all local laborers whom they shipped out. Those companies which did not avail themselves of this privilege were required to continue to send these persons to the quarantine station for disinfection.

On February 1, 1918, this disinfection of local laborers was discontinued by permission from the bureau, both by the service and

by the railroads, as it was thought not necessary for the prevention of the interstate spread of typhus fever, as it had been nearly a year since there had been any local infection in El Paso, though typhus was prevalent in the neighboring Mexican State of Chihuahua. There was no relaxation of quarantine measures against incoming passengers from Mexico.

The medical officers of the service assist the local health officers, advising with them on all matters of importance pertaining to sanitation of the city and county.

The use of the disinfecting plant by the city and county for delousing infested persons has been permitted during the entire year. A summary of transactions at the quarantine station is as follows:

Total number of persons from interior of Mexico inspected.....	24,339
Total number of "local" passengers inspected.....	1,723,464
Total number of persons disinfected (deloused) at plant.....	99,956
Total number of persons vaccinated.....	16,580
Total number of sick refused admission.....	58
Total number of pieces of baggage disinfected.....	6,329
Total number disinfected at railway disinfecting trains when same were in operation during fiscal year.....	8,762
Total number deloused for city and county.....	2,374

*Eureka (Cal.) quarantine.*—Acting Asst. Surg. C. C. Falk in charge.

During the year four vessels were inspected and passed, and 22 port sanitary statements were issued. Medical relief was also extended to various members of the Coast Guard, Army and Navy.

*Galveston, (Tex.) quarantine.*—Surg. R. L. Wilson in charge.

On account of war conditions there was a considerable reduction in the number of vessels entering quarantine as compared with previous years.

The reduction in the number of fumigations was due to the fact that for the greater part of the year no fumigation was required of vessels from Liverpool. Two naval vessels were fumigated at request to kill vermin.

During the year three gasoline-driven fans to use in clearing out gas after fumigation were supplied the station.

Some of the fill within the station bulkhead that was washed out by the storm of 1915 was replaced by the United States Engineer Department.

Several buildings at the station had the interior woodwork stained or painted and paint was renewed on the exterior.

The State quarantine station is still maintained. During a recent session of the legislature a bill to transfer the State quarantine property and function to the United States was unanimously reported by an investigating committee. It passed the house, but failed by a narrow margin in the senate.

*Georgetown (S. C.) quarantine.*—Acting Asst. Surg. W. E. Sparkman in charge.

Three small vessels with total crew numbering 20 were inspected and passed. No quarantinable diseases were noted.

*Gulf quarantine.*—Post office and telegraphic address, Gulfport, Miss. Acting Asst. Surg. C. A. Sheeley in charge.

While the quarantine station continues to be maintained at Ship Island for the detention of any persons from infected vessels, the

bulk of quarantine transactions are carried out from Gulfport, vessels being boarded in the channel just before entering the port.

*Transactions.*

Vessels entering quarantine-----	102
Vessels inspected and passed-----	63
Vessels spoken and passed-----	18
Vessels fumigated-----	21
Vessels held for observation-----	1
Total number crew inspected-----	1, 896
Passengers inspected-----	4
Stowaways inspected-----	2
Rats killed by fumigation-----	342

*Hidalgo, Tex.*—Acting Asst. Surg. W. P. Woodall in charge.

During the year a total number of 3,151 persons were inspected at this station. No quarantinable diseases were noted.

Practically all were examined for vermin, and those requiring it were subjected to naphtha baths and their clothing disinfected by hot-air sterilizer.

Three hundred and ninety-eight incoming travelers were so treated.

Thirteen hundred and seventy persons have been vaccinated during the year.

*Hoquiam (Wash.) quarantine.*—Acting Asst. Surg. H. C. Watkins in charge.

A total of nine vessels were inspected and passed during the year.

No quarantinable diseases were noted.

*Key West, Fla.*—Acting Asst. Surg. S. D. W. Light, in charge, reports as follows:

During the fiscal year ended June 30 there were inspected a total of 1,085 vessels, carrying crews aggregating 43,554 persons, and with 17,140 passengers. No quarantinable diseases were encountered during the year.

Five vessels were fumigated for the destruction of rodents.

The personnel of the station consists of Acting Asst. Surg. Light and four attendants, two for the operation of the 36-foot launch and two for the care and maintenance of the hulk *Wistaria*, which latter is intended to serve chiefly for the detention and isolation of cases of quarantinable diseases and will accommodate about 20 patients.

*Ketchikan, Alaska.*—Acting Asst. Surg. H. C. Story in charge.

A total of 192 vessels were inspected and passed, carrying a personnel of 4,087 passengers and 6,258 crew.

No quarantinable diseases were noticed on vessels arriving at quarantine.

*Laredo, Tex.*—Passed Asst. Surg. R. M. Grimm in charge.

The operations of the service at Laredo, Tex., have been conducted throughout the year under the immediate supervision of a commissioned officer, Surg. Edward Francis having served as medical officer in charge until April 24, 1918, when he was relieved by Passed Asst. Surg. R. M. Grimm. The measures which have been instituted and carried out have been those which pertained particularly to the prevention of the introduction of smallpox and typhus fever into the United States from Mexico. All of the work has been carried on in harmonious cooperation with the Texas State board of health, which still maintains a State quarantine station at this port. The operating

expenses borne by the State and those borne by the Public Health Service have been about equal.

The two legal points of entry at Laredo are the international railroad bridge and the international footbridge. Owing to the disturbed conditions existing in Mexico, passenger traffic over the railroad bridge has been practically suspended throughout the year. During a portion of the year, however, a shuttle train operated on the bridge between the station on the Mexican side and the station in Laredo. This train, being patronized by only a small percentage of the passengers desiring to cross the border, was discontinued on April 13, 1918, and has not been resumed. The footbridge has, therefore, been almost exclusively used by both local and through passengers. On this account, all of the work has been done at the footbridge, and at that place passengers arriving from Mexico undergo inspection. Special examinations are made for the presence of head and body lice and for scar of vaccination against smallpox. If the presence of lice be detected, the passenger is deloused and bathed, and his clothing and baggage are disinfected. Clothing and some parts of baggage are disinfected with steam, while other classes of baggage and articles which might be injured by steam are disinfected with hydrocyanic-acid gas. As a rule the bathing and disinfection are carried out against the peon or laboring class without special examination. All of the bathing and disinfecting at the footbridge is done at the State plant which is located at this point. All passengers who do not show satisfactory scar of recent vaccination against smallpox are vaccinated before being allowed to enter.

The service disinfecting plant at the American end of the railroad bridge, mentioned in the annual report of last year (p. 81), was completed and placed in readiness for operation in August, 1917. On account of the suspension of passenger traffic over the railroad bridge, as stated above, this plant has not yet been put into operation.

No case of typhus fever was found during the year among persons arriving from Mexico, nor was any case known to occur in Laredo or vicinity.

Two cases of smallpox were detected at the footbridge during the year. Both were in children belonging to the families of laborers. The origin of the cases could not be determined. Numerous vaccinations of contacts were done, and no secondary cases are known to have occurred.

*Quarantine transactions for year ending June 30, 1918.*

Total number of persons inspected from interior of Mexico.....	22, 280
Total number of local passengers inspected.....	708, 566
Total number of persons disinfected (deloused).....	<sup>1</sup> 4, 610
Total number of persons passed without treatment.....	724, 756
Total number of persons vaccinated.....	17, 197
Total number of sick detained for observation.....	0
Total number of sick refused admission.....	25
Number of pieces of baggage disinfected.....	<sup>2</sup> 24, 679
Number of persons examined for head or body lice or for vaccination scar.....	60, 270
Number of persons with head or body lice turned back to Nuevo Laredo, Mexico, for disinfection and delousing.....	5, 402

<sup>1</sup> In cooperation with the State of Texas at its plant located at the international footbridge.

<sup>2</sup> Exclusively by the State of Texas.



Number of certificates of health issued to persons being shipped by labor agents from Laredo, Tex., to the interior of the United States-----	10, 810
Number of shuttle trains (passenger) from Maxico over the railroad bridge inspected-----	287

*Mobile (Ala.) quarantine station.*—Passed Asst. Surg. F. M. Faget in charge. Post-office and telegraphic address, Fort Morgan, Ala.

In September, 1917, the station was again swept by a severe tropical hurricane and partially destroyed. In order to facilitate quarantine transactions the junior officer has been placed on duty at the city of Mobile to supervise the fumigation of vessels remanded to Mobile for that purpose.

During the year 353 vessels were inspected, carrying a total of 7,194 persons. This represents a material decrease in vessels inspected over that of previous years.

A plan has been proposed and is now under consideration by the bureau of abandoning the present site of the quarantine station and establishing it on the artificial island near the mouth of the Mobile River. This change of location will in no wise detract from the efficiency of quarantine operations, but will add materially to the administrative convenience and efficiency.

*Monterey, Cal.*—Acting Asst. Surg. W. L. Teaby in charge. No transactions.

*Morgan City, La., (Atchafalaya.)*—Post-office and telegraphic address, Morgan City, La. Acting Asst. Surg. W. T. McClellan in charge. No transactions.

*New Orleans (La.) quarantine.*—Passed Asst. Surg. C. M. Fauntleroy in charge.

No quarantinable diseases were observed on vessels arriving during the year. The personnel of two vessels were removed to the quarantine station and detained to complete six days, on account of suspicious circumstances, the vessels being fumigated throughout for the destruction of mosquitoes and released with new crews sent down from New Orleans. One death occurred in the quarantine hospital due to typhoid fever in the person of a seaman removed from a ship for observation and diagnosis. Owing to the urgent necessity for expediting the shipping, vessels undergoing sulphur fumigations for the destruction of rats are released before the completion of the fumigations and allowed to proceed to New Orleans, the compartments subjected to fumigation being sealed before the release of such vessel and kept closed for 10 hours from the beginning of the fumigations. Considerable difficulty was experienced at the beginning of the fiscal year in the matter of securing efficient attendants, owing to the loss of a number of trained employees who were drafted for military duty, and also to the great scarcity of men available for employment. Considerable damage was done to various structures on the station by a hurricane of unusual severity during the latter part of September. Two medical officers have been on duty continuously throughout the year and performed the duties which heretofore has kept three men busy. The hours of duty for medical officers at this station are from daylight to 12 o'clock at night. The majority of arriving vessels are from tropical American ports where yellow fever is reported or suspected, which necessitates careful thermometrical observation of

all persons on board such vessels and the exercise of constant vigilance on the part of the medical officer.

In addition to the inspection of all persons arriving on vessels to exclude quarantinable diseases, 957 alien passengers were inspected and passed at the station in compliance with the immigration laws, and 30 alien passengers were inspected and remanded to New Orleans for further medical examination on account of disease or defect.

*Newport, R. I.*—Acting Asst. Surg. E. V. Murphy in charge.

Three vessels were inspected during the year carrying a total personal of 97.

One coastwise vessel was held in quarantine on account of small-pox. All persons on board were vaccinated and the vessel was remanded to Boston quarantine station for further treatment.

*Nome, Alaska.*—Acting Asst. Surg. D. S. Neuman in charge.

During the year 5 vessels were inspected and passed, no quarantinable diseases being noted.

The general sanitary condition of Nome is good considering that the town does not have adequate sewerage system.

In proportion to the population the mortality was very small.

*Pascagoula (Miss.) quarantine.*—Acting Asst. Surg. W. A. Cox in charge.

*Transactions during the year ending June 30, 1918.*

Vessels inspected and passed.....	73
Vessels fumigated.....	19
Officers and crew inspected.....	636
Passengers and officers' families.....	5

*Pensacola (Fla.) quarantine.*—Asst. Surg. H. A. Spencer in charge.

During the year there were inspected 187 vessels and 2,842 crew and no passengers. Twenty-eight vessels were fumigated—one for mosquito destruction, the rest for rodent destruction.

No quarantinable diseases were noted.

Since November 16, 1917, the boarding and inspection of vessels has been carried out in the city of Pensacola, the quarantine station being maintained only for the purpose of detention. As a result of the cooperation of the personnel of forts and at the Coast Guard station arrangements have been made to obtain advanced information from inbound vessels, and boarding without any delay to the vessel has thus been facilitated.

In September, 1917, the quarantine station was considerably damaged by a hurricane. The necessary repairs to buildings and wharves have either been completed or are under way.

The medical officer in charge, in addition to administering the quarantine functions, has charge of the out-patient relief and performs the medical examination of arriving aliens as required by the immigration laws and regulations.

*Perth Amboy (N. J.) quarantine.*—Acting Asst. Surg. Charles W. Norton, jr., in charge.

During the year 75 vessels were inspected and 19 fumigated for the destruction of rats. The total number of passengers and crew inspected amounted to 171. No cases of quarantinable diseases were noted and no detention of vessels in quarantine, except for the purpose of fumigation.

*Port Angeles, Wash. (subport of Port Townsend station).—*Acting Asst. Surg. W. J. Taylor in charge.

During the year four vessels were inspected and passed, carrying a total of 66 crew and no passengers.

*Port San Luis (Cal.) quarantine.—*Acting Asst. Surg. C. J. McGovern in charge.

During the year there were inspected 24 vessels carrying a total of 869 crew. There were no quarantinable diseases encountered.

There were no other transactions at the station.

*Portland (Me.) quarantine station.—*Senior Surg. P. C. Kalloch in temporary charge.

During the fiscal year ending June 30, 1918, 108 steamers and 1 sailing vessels were inspected and passed. These vessels carried 82 passengers and 7,559 members of crews.

Four vessels from plague-infected ports were disinfected for the destruction of rats and other vermin. Forty-two dead rats collected from various parts of these vessels were all autopsied, but no evidence of plague infection was found among them.

No case of quarantinable disease was discovered.

*Port Royal (S. C.) quarantine station.—*No transactions. This station was out of commission for quarantine purposes, being utilized by the Navy Department as a training station.

*Port Townsend (Wash.) quarantine station.—*Passed Asst. Surg. Baylis H. Earle in charge.

One hundred and thirteen steamers were inspected and passed and 8 detained. Ten sailing vessels were inspected and passed and 6 detained. One steamer, the U. S. S. *Buffalo*, was passed on the certificate of the ship's medical officer, and 186 steamers and 10 sailing vessels bound for Seattle and Tacoma were granted provisional pratique, with the understanding that they would be fumigated at these ports when empty, the service officers there being notified by telegraph or letter. These vessels carried a total of 23,009 members of crews and 13,598 passengers. The vessels detained were fumigated with sulphur-dioxide gas by the pot method for the destruction of rats and other vermin. The work was done in the bay of Port Townsend, except in the case of the American steamship *Grayson*, which arrived direct from Shanghai, China, on February 17 with the master ill of smallpox, and the British ship *Australglen*, which arrived from Everett, Wash., on February 18, with a member of the crew ill of the same disease. Both vessels were sent to the quarantine station at Diamond Point and disinfected. The crews were moved ashore, bathed and disinfected, and their effects disinfected. The sick men were held until desquamation was completed. The vessel from Everett was referred to this station by the service officer on duty there.

Once a week vessels leaving Seattle for San Francisco via Victoria, British Columbia, were boarded at Seattle by an officer from this station and discharged at Victoria for quarantine at San Francisco, the Canadian passengers being inspected as they went aboard at Victoria. The trip in each case took two days and was made at the expense of the vessel's owners.

Two lepers were treated at the station during the year. One has been at the station since January, 1910, and has improved, except

that he has lost his eyesight. He does considerable work clearing new ground, planting garden, and sawing wood. He is a Marine Hospital patient and seems well satisfied with his surroundings. The other, an alien, is being held for the United States Immigration Service pending deportation to Austria. She becomes insane at times, when she causes much trouble, growing violent and abusive, breaking furniture and utensils, and running away from the reservation. At the request of the Commissioner of Immigration a high fence has recently been built around her quarters at the expense of the Immigration Service, and she is now being kept behind a locked gate. She appears to be quite well satisfied with the newly enforced restrictions. Her condition remains about the same as when she was admitted to the reservation on January 20, 1917.

*Providence (R. I.) quarantine station.*—Asst. Surg. M. W. Houghton in charge.

The number of vessels arriving at quarantine in this port during the fiscal year just ended has been fewer than for the previous year. A total of 26 ships have arrived here, carrying 1,386 alien passengers, and of the crews, on American ships 808 and 464 on alien ships, a total of 1,264, making a grand total of 2,592 persons inspected.

The steamship *Roma*, of the Fabre Line, was the only vessel arriving here carrying immigrants. This is a French steamer, running between Marseilles, Gibraltar, Lisbon, the Azores, and New York, making Providence a port of call going and coming on each trip. This vessel has made fewer trips this year than in any previous year since Providence was made a port of call by the line.

The other vessels arriving here have been oil tankers from Tampico, with the exception of one schooner from Nova Scotia with a cargo of lumber and one steamer and one schooner from Haiti carrying logwood.

On the 17th of May, 1918, the quarantine hulk *Newark*, which had been anchored here and used as quarantine detention vessel since August 31, 1914, was formally transferred to the Navy Department, to be stationed at Newport, R. I. The portable property not required for the proper performance of the quarantine function here was receipted for and was taken with the vessel. The property retained was stored in one of the buildings on the Rhode Island State pier, without expense to the service, through the courtesy of the Immigration Service.

The anchors which moored the *Newark* were left in their positions and were marked by a buoy. The *Newark* was towed to Newport by the Coast Guard cutter *Acushnet* and the Lighthouse tender *Pansy*. It is now being used as an isolation hospital for venereal diseases.

The services of all the attendants but two was discontinued without prejudice on the day the transfer was made. The two remaining on duty are the boarding launch man and office clerk.

*Reedy Island (Del.) quarantine.*—Post-office address, Port Penn, Del. Telegraph address, Reedy Island, Del. Passed Asst. Surg. J. R. Hurley in charge.

This station is located on a small filled-in island in the Delaware River, about 38 miles below Philadelphia and about 50 miles from the Delaware Capes. It serves as the quarantine station for shipping bound for Wilmington and Newcastle, Del., Chester and Philadelphia, Pa., and Camden, N. J.

From a quarantine standpoint the station is ideally situated, but its isolation and remoteness from the railroad makes a task of securing supplies and equipment, owing to the difficulties encountered in transportation.

The following is a brief summary of the quarantine transactions during the year:

Total vessels entering quarantine.....	884
Of these there were inspected and passed.....	846
Boarded and spoken and passed.....	29
Naval vessels boarded and passed on medical officer's certificate.....	9
Vessels held in quarantine for complete period with treatment.....	1
Vessels temporarily detained for observation purposes.....	4
Number of crew inspected.....	34, 626
Number of passengers inspected.....	81
Number of stowaways inspected.....	22
Number of vaccinations (against smallpox) performed.....	19
Number of vessels arriving in ballast fumigated.....	44
Number of dead rats collected and autopsied.....	39

In addition to the above-mentioned fumigations there were 117 vessels with cargo given provisional pratique and fumigated by the service at Philadelphia after discharging their cargo. Evidently, through causes arising out of the war, there were about 200 fewer vessels arrived at quarantine than was reported for the corresponding period of the preceding year.

Sulphur dioxide is the agent almost invariably used for fumigations at this station, due to the fact that ships must remain anchored in the stream with a certain number of men on the bridge, on deck, and in the engine room at all times, on account of the strong tidal currents, presence of ice in the river during the winter, and frequent stormy weather. The dock is too small to allow of large-size ships coming alongside for the purpose of removing their crew. However, since the inauguration of artificial ventilation through use of the Harker apparatus blower on the *Neptune* the ship can be dispatched within a very short time after opening the hatches and removing of pots.

In but few instances were ships searched for rats subsequent to fumigation, and then only to secure rats for examination to determine the possible presence of bubonic plague aboard. A total of 39 rats were secured and examined, all being negative for plague. Owing to the scarcity of vessels and the necessity for expediting shipping, a longer detention for rat searching than the minimum required for fumigation was, under the circumstances, considered unjustifiable.

On July 1, 1917, the Danish steamer *Bryssel*, from Habana and Antilla, Cuba, arrived with a sick sailor, the symptoms being suggestive of yellow fever. The patient was removed to a screened room in the isolation hospital on the station, and the ship was fumigated for the destruction of mosquitoes and detained in quarantine for a period of six days for observation. The patient, a Spaniard, who was semicomatose on arrival, died the following morning. There was much in the symptoms and in the autopsy findings in the case that was suspicious of yellow fever. Owing to the fact that the station had just been reopened as a boarding station, and that the laboratory apparatus and equipment which had been removed to Marcus Hook had not yet been returned, it was not practicable to

make a blood examination before death. From the examination of tissue made after death it was tentatively decided that the case was one of acute pernicious malarial fever. No other cases occurred aboard the *Bryssel*, and all temperatures of the crew being normal on the evening of the sixth day, pratique was issued.

July 9, 1917, the Portuguese steamer *Peninsular*, from Lisbon, arrived, the bill of health showing the presence of typhus in that port. Three members of the crew showed slight elevations of temperature. It then being about dark, the ship was held in quarantine and the three men removed from the ship to the station isolation hospital for observation. They were given a bath and a purge and their clothes put in tight bags preliminary to disinfection. The following morning, their temperatures being normal and showing no further evidence of the disease, they were returned aboard the *Peninsular* and the ship given pratique after a detention of not more than 12 hours.

July 22, 1917, the Norwegian steamer *Henrik Lund*, from Rio de Janeiro, arrived with a bill of health showing the presence of bubonic plague in that port. One of the members of the crew had bilateral inguinal lymphadenitis, with a history of having had fever en route. The ship was held in quarantine and fumigated, and the suspicious case brought ashore. The material aspirated from the buboes, stained and examined microscopically, failed to show organisms of a bipolar type. At the conclusion of the fumigation the case was returned aboard and the ship granted pratique, after a detention of something over six hours.

July 27, 1917, the Norwegian bark *Dova Lisboa*, 60 days out from Rio de Janeiro, arrived. There had been an undoubted case of smallpox on board en route. Though recovered and up on arrival, he bore the fresh, red pock marks on his face. Further, smallpox was shown on the bill of health to be present in the port of departure. The master had isolated the patient and no further cases had occurred. However, as a general precaution, the 19 members of the crew were vaccinated, and the ship, including the living quarters, fumigated before pratique was granted.

December 21, 1917, the British steamer *Etonian*, from Naples, arrived. Advice had been received from the bureau a short time previously regarding the presence of plague in that port. A member of the crew, an Egyptian, had an inguinal bubo. The ship was detained in quarantine for fumigation, and the suspect removed to the hospital ashore. Material aspirated from the bubo, stained and examined microscopically, revealed no bipolar bacilli. Subsequent to fumigation the ship was searched for dead rats. Of the 39 found, all were *Mus alexandrinus*. When autopsied, no microscopic evidence of plague was noted. The case was returned aboard and the ship granted pratique, after a detention of about 24 hours.

Of the repairs and new equipment the most, noteworthy from the standpoint of quarantine efficiency, may be mentioned the alteration of the hospital building to make a set of quarters for the junior medical officer, together with a complete set of new furnishings for these quarters; and the installation of a new steam-operated heater for the shower baths on the disinfecting dock.

The large, thick ice floes running on the strong tide in the river at times during the winter made the boarding work both hazardous and difficult, but at no time was an entering vessel allowed to suffer any appreciable delay through this cause. The *Neptune*, however, suffered through her ice-bucking operations. Owing to the coal shortage the *Neptune* had to make several trips through the ice as far as Philadelphia to secure steaming coal during midwinter, and, as a result, her bow plates were strained and seams opened that caused leaks to develop. She suffered various other damages, of a more minor character, which put her temporarily out of commission for short periods during repairs by the crew. Due to ice and storms the mooring dolphins of the hulk *Lancaster* were pushed over, and during one storm this craft threatened to go adrift, with the possible execution of an immense amount of damage. That she did not do so is believed to be largely due to the new steel mooring cables which had been but just put on. Despite all reasonable precautions much trouble was experienced during the zero weather by the freezing and cracking of heater, sewage, and water pipes, even in heated buildings. Several hot-water heating radiators at distant ends of circuits froze and bursted, though at the same time the furnaces were going full blast.

Cooperation with other Government departments: Close cooperation with the Navy has been effected at this station throughout the year. Beginning soon after the entry of the United States into the war the Navy boarding officers and patrol boats used the facilities of the disinfecting dock as a boarding base, and for the purpose of securing water for boats and shower baths for the men. On January 8, 1918, 3 officers and 10 enlisted men of the Naval Reserve Force arrived to take quarters in the cabin passengers' building, in order to increase the scope of their operations. By the end of the fiscal year this force had grown to a total of 23 officers and men.

About a week after the Navy contingent took quarters ashore on this station a case of German measles developed among them. The whole contingent was isolated in quarantine and the medical and sanitary control necessary to eradicate the disease was assumed by the service medical officers at this station. The Navy meanwhile removed their officers and patrol boats to New Castle, Del., as a boarding base. After the expiration of two weeks the original case having recovered and no further new cases having developed, the quarantine was removed, and the Navy boarding work again resumed at Reedy Island.

Emergency medical and surgical treatment has been rendered the Navy personnel both ashore and on board the patrol boats in this vicinity by the medical officers at this station throughout the year. Those suffering from diseases or injuries of a more severe nature, and whose recovery would be protracted or facilitated by hospitalization (excepting the measles cases) have been transported to the Navy hospital at the League Island yard, Philadelphia.

For a considerable period during midwinter owing to the thick ice the Navy patrol boats could not navigate, and the *Neptune* regularly conveyed the Navy boarding officers to and from incoming ships. Without the assistance of the *Neptune* the Navy's boarding

work would have been seriously handicapped if not actually broken off for a protracted period. The Navy boarding officer was for a time furnished subsistence as well as quarters aboard the *Neptune*.

On several occasions during the period of heavy ice in the river the small Navy boarding vessel stationed at Reedy Island ran out of coal, and was unable to navigate through the ice to procure additional supplies. A quantity of coal from the station supply was furnished this vessel each time, which undoubtedly prevented severe hardship and suffering aboard, had this source not been available. The borrowed coal was returned in equal amount at a later date. On at least one occasion during the winter food was supplied this Navy patrol boat in an emergency, to tide them over till they could procure further supplies, whereupon the borrowed rations were returned in like quantity.

During stormy and rough weather both this summer and last summer, when it is uncomfortable if not actually unsafe for the small naval patrol boats to navigate, the *Neptune* conveys the Navy boarding officers and men to and from incoming vessels.

The concurrent work of the service and the Navy at this station has been carried on throughout the year practically without friction, and the cooperative relations between the officers of the Public Health Service and those of the Navy have been at all times satisfactory and agreeable.

The United States Army Engineer Corps has been rendered assistance. Medical advice and treatment of an emergency nature has at various times been rendered sick or injured men employed on the Army Engineer's dredges in this vicinity, and the mail for these dredges brought to the station and delivered throughout the summer season. The Engineer's tugs and launches are frequently furnished with fresh water from the station supply.

Assistance has been rendered the Army Quartermaster's Department on several occasions. Once the *Neptune* towed to port a helpless Quartermaster's tug which had broken down in the ice and was being carried ashore by the ice floes and current. By request the *Neptune* made several short trips to Fort Delaware, which is located on an island in the river near Delaware City, at times when the Quartermaster's tug was temporarily out of commission.

Customs Service: Throughout the year two customs boarding officers have been furnished quarters on the station, and subsistence also during the major share of this period. The customs officers have also been conveyed aboard the *Neptune* to and from incoming vessels.

Immigration Service: Two immigration inspectors have been furnished quarters on the station throughout the year, also subsistence a large portion of the time. The immigration officials invariably accompany the quarantine officer aboard the *Neptune* on visits to arriving ships.

The medical inspection of arriving aliens has been conducted by the service officers at Reedy Island throughout the year. A total of 81 passengers, 22 stowaways, and 26,728 alien seamen have been inspected for immigration purposes during the year. Of these 1,043 were certified for various reasons comprehended in the immigration law.



Owing to the distance from the nearest regular relief station of the service at Philadelphia, as well as the remoteness from other available physicians, this station is being constantly called upon to furnish medical and surgical relief of an emergency and diagnostic character by those entitled to treatment at the hands of the service, also including Naval Reserve and Coast Guard crews on patrol boats in this vicinity. Excluding the measles cases above mentioned, hospital treatment has not been afforded save for the time necessary to effect arrangements to transport the case to the nearest marine or Navy hospital.

Excluding the occasions when advice or simple remedies have been furnished for coughs, colds, and constipation, which are too numerous to mention, 19 cases have been furnished with 57 dispensary treatments, and there have been given 41 surgical treatments, which include everything from dressings of simple wounds to amputations of phalanges and the reduction of fractures and dislocations.

A total of 12 antityphoid inoculations have been administered to 10 applicants. These were given to Coast Guard men, who received one or more of the series of inoculations elsewhere.

Miscellaneous assistance rendered: On two occasions the shipwrecked crews of small vessels, which had come to grief through ice or storm near by, were given lodging in the station until arrangements could be made to transport them to Philadelphia.

The *Neptune* has on several occasions gone to the assistance of vessels which had run aground in this vicinity.

*Rio Grande (Tex.) quarantine station.*—Acting Asst. Surg. G. W. Edgerton in charge.

The quarantine facilities at this station include a small frame building with limited bathing facilities, and space for detaining incoming travelers requiring delousing, which is chiefly accomplished by immersion of clothes in gasoline, if necessary, and by the application to the person of a delousing solution of kerosene and vinegar. Space in the quarantine building is given to immigration officials and quarantine and immigration procedure carried out in conjunction. During the year there were inspected 1,638 from the interior of Mexico and 6,986 local travelers. Nine hundred and eighty-nine persons were vaccinated against smallpox, and 308 were treated for the destruction of vermin. Routine vaccination at this port has practically eliminated smallpox in this region, whereas formerly it was usual every year to have a local epidemic of the disease either on the Mexican or Texan side of the border.

*San Diego quarantine station, Point Loma, Cal.*—Senior Surg. A. H. Glennan in charge.

Quarantine inspection of vessels and personnel was continued as in previous years. Fuel oil is very commonly used upon this coast in all vessels even of considerable size. The war has temporarily reduced the number of vessels from distant foreign ports, but there is constant communication with near-by ports upon the west coast of Mexico in the fishing industry and exchange of merchandise.

*Summary of transactions.*

Motor boats inspected.....	514
Naval vessels inspected or spoken and passed.....	15
Steam vessels inspected.....	23
Sailing vessels inspected.....	3
Total crew inspected.....	4, 868
Total passengers inspected.....	671

One vessel was fumigated with  $\text{SO}_2$  to destroy vermin.

During the fiscal year 8,507 blankets, 68 mattresses, 244 pillows, and 9 quilts were sterilized in the station plant for the Army base hospital, Camp Kearny. This hospital bedding was treated for contagious diseases of various kinds and was brought to this station and returned to that camp without expense to this service by Army trucks, a distance of some 12 miles.

In May, 1917, the pier and gangway was first used by the naval patrol to tie up their launches in their police patrol. A section of the naval base next introduced a number of recruits for preliminary training before sending them to various naval vessels as an enlisted reserve force. They occupied the wharf gangway and a portion of the reservation, so that there are now about 1,000 under training. Over 1,800 have been sent out during the year. While an emergency may have existed in the beginning, this Naval Reserve Recruiting Force should construct their own buildings upon the water front owned by the Navy adjoining this quarantine reservation.

A training station for the Regular Navy is located in Balboa Park in the buildings upon the exposition grounds.

A contract has been made to drive some new piling to strengthen the disinfecting pier, and only repairs of a minor character will be necessary during the coming year. The roofs of all buildings should be painted in the course of a few months.

A gas main was laid through the reservation for the accommodation of the Navy. The station buildings should be connected with this main as a matter of economy. The cost of fuel is very high and climatic conditions do not require continuous heating at any season of the year.

*San Francisco, Cal.*—Surg. W. A. Korn, in charge, reports as follows:

During the course of the year two vessels were detained in quarantine with quarantinable diseases on board, one being the United States Army transport *Sheridan*, the other being the American steamship *Écuador*. From the former two cases of varioloid were removed and from the latter one case of smallpox. In both instances the cases had been recognized early, had been well isolated on ship-board, and the entire personnel were vaccinated by the ship's surgeon. Upon arrival of the vessels in quarantine the only additional treatment instituted was the removal of cases and disinfection of the vessel.

During the months of December and January, 452 interned Germans, composed of the officers and crews of vessels, some of them with families from the Orient, were detained at the station in conformity with the request of the Commissioner General of Immigration in accordance with bureau approval.

Cooperation with other Government services has continued as heretofore, assistance being extended to customs, immigration, and naval authorities in furnishing the boarding facilities.

A large amount of disinfection by steam has been performed of bedding and clothing for the casual camp at Fort McDowell.

Under bureau order of December 14, 1917, the medical examination of alien passengers and crews on board arriving vessels as required by the United States immigration laws is now performed by the medical officers of the station.

Compared with last year the work of fumigation of vessels has increased 33 per cent, which means that 116 more vessels were fumigated during the fiscal year than in the previous fiscal year. One hundred thirty-one thousand one hundred and ninety-five pounds of sulphur, 17,247 pounds of cyanide of sodium, and 25,090 pounds of sulphuric acid were used in performing fumigation.

During the year the main section of the station wharf has been rebuilt, piers and stringers being constructed of concrete. Two of the detention barracks were equipped with 216 "Gosso" bunks, materially increasing the berthing capacity of the station. These are suspended from the ceiling by chains and springs in such a way that during the day time they can be elevated and the dormitory used for living or recreation space.

These cots are of canvas, slung on a peripheral steel frame, and because of the manner in which they are suspended they do not require springs nor mattresses. The simplicity of design should greatly operate to reduce potentiality for vermin infestation and render much easier in the necessary disinfection.

One of the most urgent needs of the station is an increased water supply. During the period that the interned Germans were detained at the station water had to be brought by the barge load and pumped into the tanks, an expensive procedure both in the cost and in the time consumed. At the present time it has been necessary to practice economy in the use of water so as to avoid a shortage before the fall rains appear, and this notwithstanding there is a station force approximating only 30 people.

*San Pedro (Los Angeles) and subports.*—Acting Asst. Surg. F. H. Nelson in temporary charge.

This station includes three ports (San Pedro, Rodondo, and Santa Barbara) for quarantine inspection of vessels.

During the year there were inspected 137 vessels with passengers and crew numbering 56,154. Eight vessels were fumigated for the destruction of rats. Quarantine operations were uneventful and no quarantinable diseases were noted.

*Savannah (Ga.) quarantine.*—Acting Asst. Surg. William J. Linley in charge.

During the year there were inspected 126 vessels carrying a total of 4,017 members of crew.

Eighteen vessels were fumigated by sulphur for rodent destruction.

No quarantinable diseases were encountered during the year.

*South Bend (Wash.) quarantine (subport of Port Townsend station).*—Acting Asst. Surg. G. A. Tripp in charge.

During the year only one vessel subject to quarantine inspection entered this port.

*St. Andrews (Fla.) quarantine.*—Acting Asst. Surg. J. A. Wells in charge.

During the fiscal year there entered this port a total of 39 vessels subject to quarantine inspection, of which number 8 were fumigated for rodent destruction. The total number of persons on vessels inspected, 232. In addition to the quarantine inspection all aliens were inspected for immigration purposes.

No quarantinable diseases were discovered on incoming vessels.

*St. Johns (Fla.) quarantine.*—Postoffice and telegraphic address, Mayport, Fla. Acting Asst. Surg. Neil Alford in charge.

During the fiscal year ending June 30, 1918, 170 vessels were inspected and passed, with a total of 2,522 crew and 67 passengers.

Most of the vessels come from West Indian or Mexican ports.

No quarantinable diseases were noted.

Sixteen vessels were fumigated for rodent destruction.

*St. Joseph (Fla.) quarantine station.*—Post office and telegraphic address, Port San Jose. Acting Asst. Surg. T. C. Kelley in charge.

During the year 21 vessels were inspected with a total number of 140 persons, chiefly crew. Most of these vessels were small crafts from Cuban and near-by ports. No quarantinable diseases were noted.

*Tacoma, Wash. (subport of Port Townsend quarantine station).*—Acting Asst. Surg. F. J. Schug in charge.

No vessels were inspected at Tacoma for quarantine purposes, as this procedure is accomplished at the Port Townsend quarantine station.

Thirty-four ships were fumigated for rodent destruction. These were passed at Port Townsend with the provisional pratique subject to fumigation after unloading at Tacoma.

*Tampa Bay (Fla.) quarantine.*—Post office and telegraphic address, Port de Soto, Fla. Acting Asst. Surg. B. B. Blount in charge.

No quarantinable diseases were encountered during the year. Part of the station facilities were utilized during the year for the accommodation of a detachment of the naval port guard. European shipping has fallen off considerably on account of the war and the diversion of vessels for other ports.

One hundred and four rats were destroyed on the 39 vessels fumigated, but it is probable that a considerable greater number were killed, as it is impossible to make a thorough search of the vessels, inasmuch as most of them leave the station for Tampa before the fumes are sufficiently dissipated to permit a thorough search.

The transactions at the station were as follows:

Vessels entering quarantine.....	211
Vessels inspected and passed.....	272
Vessels fumigated.....	39
Passengers inspected.....	109
Crews inspected.....	3,606

*Washington, N. C.*—Acting Asst. Surg. John C. Rodman in charge.  
No transactions.

*Transactions at foreign, oriental, and insular stations for fiscal year ended June 30, 1918.*

Stations.	Total number of vessels inspected.	Number of vessels fumigated.	Total number of passengers and crews inspected.
Aguadilla, P. R.	1		8
Arecibo, P. R.			
Arroyo, P. R.	1		10
Callao, Peru	186	155	26,319
Cavite, P. I.	34		3,161
Cebu, P. I.	90	4	5,334
Christiansted, Virgin Islands	16		241
Frajardo, P. R.	54		523
Frederiksted, Virgin Islands	36		3,212
Guanica, P. R.	183		6,553
Guayaquil, Ecuador	57	53	6,600
Habana, Cuba	1,609	743	105,786
Hilo, Hawaii	34	33	919
Hongkong, China	300	70	63,552
Honolulu, Hawaii	534	95	143,948
Humacao, P. R.	4		65
Iloilo, P. I.	26	5	1,312
Jobos (Aguirre), P. R.	13		467
Jolo, P. I.	26	1	2,217
Kahului, Hawaii	25	2	410
Kolos, Hawaii	12		137
Lahaina, Hawaii	1		9
La Guaira, Venezuela	83		9,756
Mahukona, Hawaii	3		48
Manila, P. I.	543	24	88,734
Mayaguez, P. R.	67		2,624
Naples, Italy	87		2,237
Olongapo, P. I.	4		520
Palermo, Italy	1		23
Ponce, P. R.	57		4,889
Progreso, Mexico	67	54	3,596
St. Thomas, Virgin Islands	234		10,916
San Juan, P. R.	324	23	30,460
Shanghai, China	166	39	14,179
Tampico, Mexico	731	434	
Tuxpam, Mexico	171	101	6,869
Vera Cruz, Mexico	27	9	18
Zamboanga, P. I.	36		4,456
Amoy, China	7		
Total	5,850	1,845	550,108

## FOREIGN QUARANTINE.

### AMOY, CHINA.

Acting Asst. Surg. J. H. Snoke reports as follows:

The work of the medical officer attached to the consulate at Amoy has been much affected during the last year by conditions due to the war. The steady requisitioning of ships for Government work, on which comment was made in this office's report for 1916-17, has continued to an even greater degree. The result naturally has been the diminution of the number of passengers embarking from Amoy for Manila.

During the last fiscal year there have been seven direct sailings. Two of these were by the British steamer *Taisang* and the other five by the interned German steamers taken over by the Philippine government at the time America entered the war. These vessels, under the supervision of the customs authorities at Manila, have been engaged in carrying coal from Chi'ing-wan-tao, in north China, to Ma-

nila, and on their return trips have stopped at Amoy for passengers and in some cases for cargo. Of the bills of health issued, six were original and one supplementary.

The manner of inspection and supervision of passengers, which was described in considerable detail in last year's report, has not been changed. All steerage passengers are bathed immediately before embarking and on shipboard there is an inspection of all other passengers and of the crew. Any afflicted with quarantinable diseases are put off the ship. In addition to this, where the sanitary condition of a first-class passenger is found to be unsatisfactory, he also is required to take a bath. There is disinfection by steam of the clothes of all passengers bathed, and careful inspection of their effects with subsequent disinfection by steam of any baggage which is unclean.

On the ships which have sailed direct for Manila 2,137 passengers have embarked. This number is only about 55 per cent of the number embarking last year, the decrease, of course, being due to the fact that there were only seven direct steamers for Manila.

All Chinese who come to the consulate at Amoy with the request that their Chinese laborers' return certificates be extended, assigning illness as the reason for their request, are required to submit to a physical examination by the medical officer attached to the consulate. In the year just ended there were 77 such requests, in two of which cases the extension was withheld.

The same precautions about cargo have been taken as were taken in the preceding year. It is not permitted that fresh vegetables and similar products which might most easily carry infectious diseases be shipped, and it is required that all cargo be "rat proof" so far as is possible and that it be loaded from rat-free lighters and cargo boats. As was the case in 1916-17, the only shipments direct to the United States were of narcissus bulbs, which were inspected to make certain of their being free from mud and of their being in a dry state.

Weekly sanitary reports have been sent to Washington and to Hongkong, Shanghai, and Manila. As is the case in every port in China it is exceedingly difficult to secure reliable data for these, but every effort has been made to have them as complete and as accurate as possible.

From the viewpoint of general health Amoy has been fortunate. In spite of the prevalence of cerebrospinal meningitis in Hongkong, and of the prevalence of pneumonic plague in north China, this port has succeeded in keeping almost clean of the former and entirely clean of the latter of these diseases. Isolated cases of bubonic plague doubtless exist, but it can not be considered epidemic. Typhoid, smallpox, and diphtheria all have taken their toll, but compared with other years these diseases have not been serious.

In conclusion it only remains necessary to mention the beginning of a great improvement, the full value of which, however, will not be attained until after the conclusion of the war and the restoration to the Manila trade of the ships now in Government service. In the typhoon of last year the floating disinfecting plant of this port was destroyed. This plant was small, badly arranged, and ill adapted to the work, and the erection of a modern disinfecting plant is a most decided advance. Work on this new plant has already commenced; and as the plans for its construction were drawn in accordance with

the wishes of the consul at Amoy and of the medical officer attached to the consulate the emigration disinfection of the future will be handled far more efficiently.

#### CALLAO, PERU.

Acting Asst. Surg. J. L. Castro-Guiterriez reports as follows:

During the course of the year 186 vessels destined for ports of the United States or its possessions were inspected. One hundred and fifty-five of this number were fumigated prior to sailing, either for the purpose of the destruction of rats or the destruction of mosquitos. During the calendar year of 1917 there were reported for all Peru 414 cases of plague. There was a greater number of the cases in the Department of Lima and Libertad than in previous year. It seems probable that the subsidence of infection in those departments where it has decreased is due more to the operation of natural causes than as a result of any precautions taken.

Smallpox occurred in epidemic form in several small towns in the interior.

Malaria has increased in Callao and in Lima, where there have been a number of cases of the malignant type of the infection.

Typhoid also increased at Lima and Callao, no efficient measures having been taken to combat the spread of the disease.

The death rate for the calendar year 1917 was 42.74 per 1,000.

The chief causes of the deaths were as follows:

	Deaths.
Typhoid fever.....	24
Typhus fever.....	0
Malaria.....	24
Smallpox.....	0
Measles.....	1
Scarlet fever.....	0
Whooping cough.....	2
Diphtheria.....	6
Influenza.....	7
Bubonic plague.....	9
Yellow fever.....	0
Erysipelas.....	1
Tuberculosis of the lungs.....	317
Other tuberculosis.....	84
Enteritis from 0 to 1 year.....	105
Enteritis from 1 to 2 years.....	22
Other diseases.....	549
Puerperal fever.....	3
Without medical attendance.....	342
Total.....	1,496

#### GUAYAQUIL, ECUADOR.

Acting Asst. Surg. Carlos V. Coello reports as follows:

During the fiscal year just closed the following quarantinable diseases prevailed in this port, namely, yellow fever, plague, smallpox, and leprosy.

In Guayaquil proper there were during the year 123 cases of yellow fever, with 60 recoveries and 62 deaths, 1 remaining under treatment at the close of the fiscal year.

In Malagro there was one case, in Babahoyo one case, in Naranjito one case, and in Yaguachi one case.

The figures presented are very low on account of the lack of positive diagnosis in many instances and the number of unreported cases that were treated. In January, 1918, the disease appeared to have disappeared, but in March there was a case in Babahoyo among troops from the interior that recently arrived there, and from that place was transmitted to Guayaquil and broke out afresh. These 131 reported cases indicate a decrease in the prevalence of the disease in comparison with its prevalence of the previous year, when there were 241 cases reported.

*Bubonic plague.*—During the year there occurred 404 cases in Guayaquil, resulting in 145 deaths.

In Duran there were five cases, one death, and in Babahoyo one case. Since the year 1908, when the disease was introduced, a number of cases occurring yearly have continued, more or less, without decrease. Deratization, vaccination, and fumigation have been enforced, but the work has not been carried out effectively nor on a sufficiently large scale. The ineffective system of disposal of garbage, almost complete lack of drainage and sewerage, and the old type of construction of buildings, permitting rat harborage, all add to the difficulty of eradication and create a favorable condition for the persistence of the infection.

*Smallpox.*—After an absence of several years this disease reappeared in Guayaquil in November, 1916, and in the two succeeding years has increased in prevalence. There is compulsory vaccination in Ecuador and the practice is quite extensively carried out by employees in the service of sanitation. The vaccine is manufactured in Guayaquil at the "Instituto de Vacuna," and has proved, on test, a high degree of potency. All passengers intending to leave for the United States or the Canal Zone are required to show evidence of a recent vaccination before embarkation.

*Leprosy.*—There was only one case reported during the year, but there are several cases living in the city without treatment and without any official cognizance being taken of them. Occasionally they are picked up and sent to the leper home at Cuenca in the interior of the country. The leper homes at Cuenca and Pifo are both filled up to their maximum capacity at the present time.

Typhoid fever, dysentery (amebic and bacillary), tuberculosis, and malaria all prevail as in former years. Malaria is generally prevalent throughout the Republic, extending to altitudes as high as 1,000 feet above sea level. During the calendar year of 1917, there were reported 424 deaths caused by this disease.

Improvements in matters of sanitation at Guayaquil are practically at a standstill. The project for improvement of the water supply which has been under consideration for several years, still remains in abeyance, although the Government has tentatively decided upon the Daule River project, as it is less expensive and requires less time to construct than the alternative plan of securing water supply from mountain source. This latter plan, however, is the one which finds favor amongst a majority of the citizens.

It may be mentioned that during the year two prominent American citizens died with yellow fever; one the wife of the American consul



general and the other the superintendent of a well-known commercial concern.

*Summary of quarantine transactions.*

Bills of health issued.....	96
Vessels fumigated.....	53
Vessels inspected and passed.....	4
Vessels passed without inspection.....	39
Number of crew inspected.....	4,820
Number of cabin passengers inspected.....	1,273
Number of steerage passengers inspected.....	507
Number of cabin passengers for the United States.....	433
Number of steerage passengers for the United States.....	98

HABANA, CUBA.

Acting Asst. Surg. Richard Wilson reports as follows:

The work of this office includes: (1) Issuance of bills of health in conjunction with the consul general to all vessels bound for the United States or its dependencies; (2) reporting on the sanitary condition of the city and environment; (3) fumigation of vessels when necessary; (4) the inspection of vessels, crews, and passengers; (5) medical relief of sick seamen on American vessels.

The number of bills of health issued and fumigations performed have increased but the total amount of work has diminished, due, in part, to the subsidence of bubonic plague in Habana and, in part, to changed circumstances attendant upon the entrance of the United States into the European war. This inspection of fruit cargoes or other merchandise liable to harbor rats was discontinued and the fumigation of vessels reduced to a routine of once in four months.

Bills of health were issued to 2,286 vessels bound for the United States or its dependencies, an average increase of about 12 vessels per month, and an increase of 142 over prior fiscal year. The number of crews on these vessels was 99,593, and the number of passengers was 34,283.

Vessels requiring fumigation at Habana are divided into two classes: First, those vessels fumigated by the service employees; and second, vessels fumigated by the Cuban authorities under the supervision of the service representative. The former includes vessels sailing direct to United States ports, and the latter includes vessels sailing to United States ports by way of other Cuban ports.

During the fiscal year 120 sick seamen from American vessels were treated, and of this number 11 were sent to hospital, the remaining 109 suffering only from minor ailments being treated on board or in the service office.

No bubonic plague has been reported in man or rat for the past three years, but the Cuban sanitary department continue the work of deratization. During the fiscal year the number of rats captured was 28,732, and of this number 11,106 were examined.

Typhoid fever heads the list of communicable diseases in Habana with 969 cases, including 180 deaths. This was more than double the number occurring during the previous year. There were 51 cases of paratyphoid fever including 6 deaths.

Next to typhoid fever malaria has caused the greatest morbidity, there having been 593 cases, with 5 deaths, a slight increase over

the previous year. Malaria is reported prevalent over the entire island, but especially so in the eastern part. Recently the Cuban congress appropriated \$250,000 for eradicating malaria and typhoid fever in the eastern part of the island, the money to be available during the coming fiscal year.

There were 427 cases of chicken pox with no deaths. This was in contrast with 72 cases in the previous year.

Both measles and diphtheria have occurred to some extent, there being 228 cases of the former and 198 cases of the latter.

Among the improvements contemplated by the sanitary department in the near future is the building of the sewerage system of Santiago de Cuba, for which project there has been appropriated the sum of \$400,000. Studies are now being made as to the water supply of Santiago de Cuba, and improvements are already under way for improving the water supply for Habana.

*Tabulation of service transactions in Habana.*

Vessels inspected-----	1,609
Vessels not inspected (via foreign ports)-----	577
Total bills of health issued-----	2,286
Total number of crew inspected-----	71,505
Total passengers inspected-----	34,283
Vessels fumigated by the service force-----	593
Vessels fumigated by Cuban authorities under supervision of the service force-----	150

OPERATIONS OF THE SERVICE IN HAWAII.

The activities of the United States Public Health Service in the Hawaiian Islands for the fiscal year ended June 30, 1918, were as follows: (1) National quarantine; (2) marine-hospital relief; (3) medical examination of immigrants; (4) plague laboratory; (5) physical examination of applicants for marine licenses and other Government positions.

*General.*—There are 10 medical officers stationed at the six ports of entry, 2 of whom are commissioned officers and the remainder acting assistant surgeons.

Honolulu is the only quarantine station in the islands that is completely equipped to handle infected vessels and their personnel. At the subports of Hilo and Kahului there is sufficient equipment for the fumigation of vessels by the pot-and-pan method, while the remaining ports of Mahukona, Lahaina, and Koloa are simply inspection stations.

Since the dismantling and removal of the quarantine wharf in November, 1916, this port has been without any facilities for the treatment of infected vessels, except fumigation by the pot-and-pan method, and without any facilities for the landing and bathing of the personnel of vessels.

During the year seven vessels arrived with histories of having had smallpox on board during the voyage, while three vessels arrived with leprosy.

Vessels inspected: Six hundred and nine vessels were boarded and inspected upon arrival at the following ports of entry, namely: Honolulu, 527; Hilo, 34; Kahului, 25; Mahukona, 3; Lahaina, 1;

and Koloa, 12, while 7 vessels were spoken and passed at Honolulu and 43 were boarded and passed on medical officers' certificates.

Six hundred and eighty-eight port sanitary statements were issued to departing vessels at Honolulu, 70 at Hilo, 40 at Kahului, 6 at Mahukona, 3 at Lahaina, and 15 at Koloa.

Only eight Panama Canal Zone bills of health were issued at the several ports during the year.

#### QUARANTINABLE DISEASES ON ARRIVING VESSELS.

*Smallpox.*—The steamship *Oranje* arrived from the Dutch East Indies via Chinese and Japanese ports on October 4, 1917, with the history of having had a death from smallpox on September 30.

The case was in the person of a second-class passenger, an American child of 2 years, who sickened on September 22 and died on the 30th. The remains were buried at sea.

All the personnel on this vessel were examined, and those not presenting recent marks of vaccination or evidences of having had smallpox were revaccinated. The cabin occupied by the case and the ship's hospital were disinfected and the vessel allowed to take on coal and water in quarantine.

The American steamship *Adeline Smith* arrived March 11, 1918, from Shanghai with the history of having landed a member of the crew with smallpox just previous to the vessel's departure.

The vessel had been disinfected and crew vaccinated under the direction of Acting Asst. Surg. Ransom before sailing from Shanghai. As there had been no further illness, the vessel was granted pratique.

Dutch steamship *Vondel* arrived January 31, 1918, from the Dutch East Indies, via Chinese and Japanese ports, with a second-class passenger ill with confluent smallpox. This patient sickened on January 24, while the vessel was enroute from Yokohama to Honolulu. Infection in this case was very probably contracted in Siberia, for he left Vladivostok about January 14, reached Yokohama on the 20th, and went immediately aboard the *Vondel*.

This man, an intelligent young American, had been representing the International Harvester Corporation, of Chicago, in Russia and Siberia and had never been vaccinated.

The patient was removed to quarantine, the personnel on the vessel revaccinated, cabin occupied by the case and the ship's hospital disinfected, and the vessel granted pratique.

Japanese steamship *Korea Maru* arrived March 31, 1918, from Chinese and Japanese ports with the history of having landed a case of smallpox at the Yokohama quarantine station on arrival of the vessel from Kobe and of having four additional cases occur just before the vessel's departure for Honolulu, which necessitated a return to the Nagahama quarantine station for the landing of the cases and treatment of the personnel and vessel.

As there had been no further cases of illness or anything suspicious during the voyage, the vessel was granted pratique when the vaccination of 20 Russians in the second cabin had been completed.

Japanese steamship *Tenyo Maru* arrived from Chinese and Japanese ports on April 29, 1918, with the notation on the bill of health

of the removal of a steerage passenger at Yokohama on account of smallpox.

There had been no sickness of a suspicious nature during the voyage, and the only measure taken was the vaccination of 117 steerage passengers from Hongkong.

American steamship *Venezuela* arrived from Chinese and Japanese ports on May 3, 1918, with the history of having landed a steerage passenger at the Nagahama quarantine station with smallpox. On the vessel's arrival the ship surgeon reported that he had 3 cases of smallpox in the hospital and 11 cases suspicious of the disease. On examination all the cases were found to be typical cases of varicella.

After inspection the vessel was granted pratique, the cases reported to the board of health, and the hospital and steerage quarters disinfected after removal of the sick and steerage passengers.

U. S. S. *Tjikenbang* arrived June 1, 1918, from Manila with the history of having landed, prior to departure, a member of the crew with varioloid. As the naval surgeon had taken all the necessary precautions the vessel was granted pratique.

The cases of smallpox removed from the steamships *Korea Maru*, *Tenyo Maru*, and *Venezuela* at Yokohama, were in probability all varicella, for the sick consisted entirely of Filipinos; all the cases removed at Yokohama were later examined upon arrival at this port, and they failed to show any scarring and all presented at least three successful vaccination scars; while the Filipinos removed at this port from the *Venezuela* and turned over to the board of health, stated that the Filipino removed at Yokohama had the same symptoms that they presented.

*Leprosy*.—Two vessels arrived during the year with leprosy on board, and one with the history of having landed a case of the disease at a port touched at during the voyage.

Those with leprosy on board consisted of the American steamship *China* and the Japanese steamship *Shinyo Maru*. The patients in both cases were Japanese of many years' residence in California, who were returning to Yokohama.

#### CONTAGIOUS DISEASES ON ARRIVING VESSELS.

One hundred and twenty-seven vessels arrived during the year with contagious and infectious diseases on board, of which there were 60 cases of measles; 39 of mumps; 1 of diphtheria; 2 of scarlet fever; 3 of epidemic cerebrospinal meningitis; 2 of pertussis; 19 of varicella; 109 of tuberculosis; 14 of typhoid fever; and 3 of erysipelas.

Of this number there occurred amongst the personnel of transports, 55 cases of tuberculosis, 29 of mumps, 29 of measles, 2 of varicella, and 9 of dysentery.

These cases were mostly removed at this port and taken to the departmental hospital, Fort Shafter, while those occurring on other vessels were reported to the board of health and passengers detained on board until the cases had been seen and action taken by a representative of that service.

#### DEATHS AMONGST THE PERSONNEL OF ARRIVING VESSELS.

A total of 57 deaths occurred on vessels arriving at this port during the year, of which 7 were from tuberculosis, 2 apoplexy, 1 syphi-

lis, 3 cancer, 4 beriberi, 14 pneumonia, 1 fracture, 6 bronchitis, 3 rheumatism, 1 malnutrition, 5 heart disease, 1 still born, 1 asthenia, 1 smallpox, 1 intestinal obstruction, 2 ulcer of stomach, 1 cerebrospinal meningitis, 1 septicemia, 1 suffocation, and 1 from gastritis.

The remains of 24 persons were buried at sea, while 11 remains were landed at ports touched en route, and 22 were embalmed on shipboard and carried to the ultimate port of destination.

#### PANAMA CANAL.

During the year 12 vessels arrived from Atlantic ports by way of the canal, while 7 departed from the islands for ports on the east coast of the United States. This is a reduction of 57 vessels as compared with the record of the preceding year.

The nationality of the vessels was as follows: British, 3; Dutch, 6; American, 6; Norwegian, 2; and Japanese, 2.

#### FLOATING EQUIPMENT.

The floating equipment has been kept in a highly efficient condition throughout the year. The boarding launches *Oahu* and *Pelican* have never broken down while under commission and have rendered excellent services.

#### DISINFECTING MACHINERY.

The machinery, consisting of boilers, steam chamber, sulphur furnaces, fans, piping and pumps, which was taken down and removed from the wharf when the latter was dismantled in November, 1916, is still under the temporary shelter made for it at that time.

Under the terms of the contract this machinery should have been reinstalled on the new wharf and placed in its original condition by March 1, 1917, but, even if the present plans are carried out, a period of two years will have elapsed during which this machinery has lain idle without any care or attention whatever.

#### RAT QUARANTINE.

All the vessels engaged in the interisland trade were fumigated at regular intervals throughout the year for the purpose of keeping them as rat and insect free as possible, and as a result of the continued fumigations of these vessels there has been noticed a very marked diminution in the number of rats obtained.

The vessels fumigated for the purpose of rat eradication were classified as follows:

- (1) Vessels from foreign ports.
- (2) Vessels bound for United States ports.
- (3) Vessels engaged in the interisland trade.

The trans-Pacific liners and transports touching at this port were, without exception, regularly fumigated at San Francisco.

On the whole, the number of rats obtained at each fumigation of these vessels showed a gratifying decrease throughout the year, but there were some exceptions and one in particular, the *Persia Maru* remained rat infested throughout the year.

This vessel was fumigated four times with a total yield of 389 rats, while 131 were trapped by the crew and 80 were killed in clear-

ing and overhauling of the ship's boats, which is an increase of 101 rats as compared with this vessel's record for 1917.

#### FUMIGATION OF VESSELS FOR MOSQUITOES.

The fumigation for the destruction of mosquitoes of vessels from ports on the west coast of Mexico, Central and South America was continued during the year, a total of 14 vessels being so treated.

#### RAT-GUARD INSPECTION.

The rat-guard precautions, as specified in department circular letter of June 10, 1912, were strictly enforced during the year, and only in the case of tramp vessels was any difficulty encountered in enforcing the requirements.

Experience has shown that there should be some penalty attached for failure on the part of masters of vessels to carry out the written instructions received by them.

#### CREMATIONS.

The remains of 12 persons were cremated at the quarantine station during the year, the following being the causes of death, namely: Leprosy, five; ptomaine poisoning, one; typhoid fever, one; pulmonary tuberculosis, two; pneumonia, two; septicemia, one.

#### AID RENDERED TERRITORIAL AND OTHER GOVERNMENT SERVICES.

*Board of health.*—One typhoid carrier was received, isolated, and treated at the quarantine station.

The remains of five persons dying from leprosy, one from ptomaine poisoning, and one from pulmonary tuberculosis were cremated.

A number of swabs were prepared and sterilized, and a large amount of media was made for the board of health.

*Foreign consuls.*—Eight seamen were admitted to hospitals and two were furnished out-patient treatment upon the request of their respective consuls.

*Post office.*—Disinfectants were furnished during the year to the local post office for the purpose of treating the mails from the leper settlement on Molokai.

*Lighthouse service.*—Four employees were admitted to hospital and 12 were furnished out-patient treatment at the request of the inspector of the nineteenth district.

Upon the request of the local inspector a sanitary inspection was made of the Honolulu lighthouse, and the family of the keeper were physically examined by a commissioned officer of the service.

#### PLAGUE ON THE ISLAND OF HAWAII.

Plague was again reported only from the island of Hawaii. It has been present there for the past 18 years, and, as in the past, it continued to remain localized to the Hamakua district.

There were four cases of human plague reported during the year, with a fatal termination in each case.

The first case occurred in the person of the Hawaiian wife of the station agent at the Kukaiau railroad station.

She sickened on August 30 with cervical adenitis and died on September 1. When the board of health examined the premises two dead rats were found under the house, one of whom was proven to have died from plague. The second case was that of a Japanese stableman at the Kukaiau plantation, who sickened on August 30 with inguinal adenitis and died on September 3.

This man in working about the stables a few days before his sickness found a dead rat, which he picked up and burned.

Searching of the stables and adjacent surroundings and trapping in the neighborhood resulted in the finding of 14 plague-infected rats.

During the first six months of 1917 there had been three cases of human and four of rodent plague in the Hamakua district, where the disease has been present for the past eight years.

Heretofore the disease has invariably followed the rainy season, but the year 1917 was an exception, for a severe drought had prevailed along the Hamakua coast; all vegetation was parched and burned, the irrigation ditches were dry, and because food and water were lacking in the cane fields and gulches the rodents were forced to enter the stables, stores, and human habitations in the search for food.

The third case occurred in the person of a Canadian storekeeper at Laupahoe, who sickened on May 1 with a double cervical adenitis and died on May 5.

The fourth case was in the person of a Japanese barber at Laupahoe on May 3 with inguinal adenitis, which resulted fatally on May 6.

Both these cases gave a history of having found dead rats in the store and barber shop a few days previously, which they had collected and burned.

The territorial board of health instituted the most energetic measures in all cases, additional rat trappers being employed, and a very extensive poisoning campaign was carried out. But as stated in previous reports the task of freeing this district of plague is one of immense proportions, for the country is very rocky and abounds in hills and deep gulches, which can not be penetrated by man without the greatest difficulty.

Rodents can obtain abundant food in the cane fields, and owing to the ready and secure shelter to be found in the adjacent gulches, stone walls, and fissures in the lava rock it is almost impossible to attempt anything but to keep the habitations and buildings as rat free as possible.

There were 24 plague-infected rodents obtained during the year from the Hamakua district, of which 2 were found in July, 1 in August, 14 in September, 4 in October, 2 in March, and 1 in May.

#### RAT CAMPAIGN.

Sixteen thousand two hundred and seventy-five rats and mongoose were trapped in the district of Honolulu during the year, of which 16,006 were trapped, 104 were killed in the fumigation of vessels, 3

were found dead and brought in by outsiders, 27 were shot from trees, while 136 mongoose were taken.

This was a decrease of 1,255 rodents as compared with the number obtained during the previous year.

There were seven trappers employed during the year, and the area covered in trapping operations was principally the water front, wholesale district, and adjacent sections.

#### HONGKONG, CHINA.

Acting Asst. Surg. S. Seguin Strahan was in charge of service operations at this port. During the year there was a rather severe epidemic of cerebrospinal meningitis, and measures were enforced to prevent the spread of this infection to the Philippine Islands.

Plague infection, which had been more or less dormant in the colony, increased markedly during the latter part of the fiscal year, both in human and in rodents. For the months of May and June, 1918, there was a weekly average of 18 cases among human beings and of the rodents about 14 per week were reported as infected. The necessary precautions were observed for preventing the spread of this infection to ports of the United States and to its insular possessions.

Vessels were fumigated prior to sailing for the purpose of rodent destruction, and the practice of fumigating cargo lighters was continued in force throughout the course of the year. Nine hundred and sixty-five lighters were fumigated, 1,157 rats being recovered. It is probable that the number destroyed was considerably in excess of this figure.

#### *Transactions.*

Number of vessels granted bills of health-----	300
Number crew inspected-----	31, 336
Number passengers inspected-----	32, 216
Number vessels fumigated-----	70
Number rats found after fumigation of ships-----	267
Number cargo lighters fumigated-----	965
Number rats found after fumigation of lighters-----	1, 157

#### LA GUAIRA, VENEZUELA.

Acting Asst. Surg. W. J. S. Stewart reports that during the year there occurred in Venezuela cases of yellow fever, bubonic plague, and smallpox, in addition to a high rate of morbidity in nonquarantinable diseases.

In September, 1917, one case of yellow fever was reported from Caracas in the person of a female domestic who had arrived from Barquisimeto some six months previously. This case was reported as yellow fever by the assistant director of the Oficina de Sanidad Nacional, and the diagnosis still remains as an official record. Dr. Juan Guiteras, who was at that time in Venezuela investigating sanitary conditions as a member of the Rockefeller commission for the study of the prevalence of yellow fever in Central and South American countries, made an investigation of this reported case at Caracas, and came to the conclusion that the diagnosis was erroneous. In view of the fact that there was a large number of *stegomyia* mosquitoes present, and the conditions were all favorable for an



extension of the disease had it been present, the lack of secondary cases would seem to throw considerable doubt on the reliability of the diagnosis of yellow fever.

In the latter part of the year of 1917 yellow fever was reported as prevalent in the town of Coro which lies to the eastward of the entrance to the Gulf of Maracaibo and some few miles inland, but connected with the port of La Vela de Coro by rail communication. Investigation of Coro seemed to indicate that yellow fever had existed in that community for at least three or four years though not in epidemic form for several months previous to the investigation. Several cases were seen by Dr. Guiteras and were diagnosed by him as yellow fever.

During the calendar year 1917 there occurred 17 cases of yellow fever at Coro, with rather high death rate. During the course of investigations suspicion was directed toward the town of Barquisimeto, located on the Bolivar Railway, and some 520 meters in altitude, where illness of a suspicious nature occurred in the early part of 1917. However, no systematic attempt at a thorough investigation was made in that locality.

The infection of Coro was shown to be evidently an old affair, and in all probability cases have occurred there from time to time in persons who have come to the town for a night or so and have returned to their homes in the surrounding country, where, being without medical attention, their illness was undiagnosed and, presumably, passed unnoticed. The last case of yellow fever was reported as occurring in Coro in October, 1917.

In February and in March, 1918, an outbreak of bubonic plague was reported as occurring in the vicinity of Charallave, a small settlement some 70 kilometers to the southward of Caracas. Cases occurred on a large plantation where plague infection had been reported some eight years previously. In all, there were 10 cases and 6 deaths. The disease apparently has not spread from its original place of appearance, and the last case reported was on March 26, 1918. There was no evidence that the disease was introduced. It appears to have been a recrudescence from a latent or unrecognized focus. In the Oficina de Sanidad Nacional, it is thought that the disease was prevalent in ground squirrels, which are numerous in that locality. At the present time the city of Caracas is swarming with rats and offers very favorable conditions for the spread of bubonic plague, should it be introduced.

An outbreak of smallpox was reported in the country south of Lake Maracaibo. This disease has been pretty well disseminated throughout the southern portion of Venezuela for years. The majority of persons coming from those districts bear facial evidence to this fact.

Throughout the year there has been no case of quarantinable disease in Lagunayra, Caracas, or Puerto Cabello, the so-called case of yellow fever reported in Caracas in September, 1917, not being considered as such.

For the first time in history, relapsing fever was found in Venezuela, the bacteriological work being done by a member of the Rockefeller Foundation, who discovered the spirillum of Obermeyer in the blood of a private patient at the Vargas Hospital.

Leishmaniosis cutanea was also discovered to exist in Venezuela. It seems probable that the disease has been in existence in Venezuela but unrecognized as such.

*Summary of transactions.*

Total bills of health issued.....	82
Total number of crews.....	8, 207
Total number of passengers.....	2, 926

OPERATIONS OF THE SERVICE IN THE PHILIPPINES.

Surg. J. D. Long, chief quarantine officer, reports as follows:

The activities of the United States Public Health Service in the Philippine Islands are relatively comprehensive. The volume of work has at times been great and has been accomplished with a minimum of opposition and with a limited personnel. The functions of the service carried on in the Philippine Islands naturally fall into seven divisions: (1) National quarantine, (2) consular quarantine, (3) interisland quarantine, (4) medical inspection of immigrants, (5) physical examination of applicants for marine licenses and other Government positions, (6) the sanitary maintenance of vessels and ports, (7) miscellaneous functions not included in the six preceding divisions.

Inspection stations are maintained at the ports of entry, and disinfection and detention stations are operated at central points.

Medical officers of the United States Public Health Service are on duty at Cavite, Cebu, Iloilo, Jolo, Manila, Mariveles, and Olongapo. For the northern islands a quarantine disinfection and detention station is maintained near the north channel of the entrance to Manila Bay at Mariveles, a town on Mariveles Bay, 30 miles from Manila. For the southeastern islands a station is maintained and operated on the island of Cautit, in the harbor of Cebu, about 4 miles from that city. The former station is one of the most completely equipped and scientifically arranged in the service and in the Orient. It was constructed in 1900 and 1901 and has met all demands upon it and has been kept in a high state of operative efficiency. The station at Cebu is well equipped as far as the treatment of vessels and their personnel is concerned. The buildings, however, are of second-class construction and materials only.

GENERAL ASPECT.

The responsibilities which rest upon the quarantine officers in preventing the introduction of communicable diseases into the Philippine Islands from abroad may be partly comprehended when the sanitary conditions of the Orient in general are considered and when it is realized that the Philippine Islands are but a few days' travel by water from some of the world's greatest foci of quarantinable diseases. This condition makes the quarantine function a continuing necessity.

During the fiscal year under report conditions were apparently more favorable than the year before. It might be called a negative year, as no very extensive epidemics occurred in the port cities adjacent to the Philippines with which our traffic naturally is greater

than with ports more distant. This proximity and the fact that many vessels arrive from foreign ports before the incubation period of any of the quarantinable diseases has elapsed makes the problem difficult to handle and is the reason for constant anxious care. Further, the constantly increasing commerce not only in volume, but in the wider extent of territory from which merchandise is being shipped to the Philippines, also augments the necessity for quarantine surveillance.

It is gratifying to state that, although a number of cases of quarantinable diseases were detected upon inspection and treated at the quarantine stations, there occurred no known case of quarantinable disease in the Philippine Islands which was directly or indirectly traceable to introduction from abroad.

#### INCOMING QUARANTINE.

All vessels arriving in the islands from foreign ports were inspected upon arrival. Owing to the reduced number of vessels diminished by war conditions vessels were heavier laden and carried a larger number of passengers per vessel than obtained in previous years. A large falling off in the tourist class of passengers was in evidence.

Practically all the quarantinable disease, with the exception of yellow fever must be looked for upon inspection at quarantine at all the ports of entry, and cases of nearly all of the diseases were detected upon arriving vessels at quarantine inspection and the necessary treatment rendered and precautions taken, and, while a number of cases were transported to our hospitals and treated, no secondary cases occurred nor could further transmission of the infection be traced. The crews and arriving steerage passengers from abroad were vaccinated prior to landing to prevent the admission of unvaccinated persons into the districts of the Philippines which have been fairly completely vaccinated, and stool specimens were taken from all arrivals from cholera centers in order to protect the Philippines from the entrance of cholera carriers.

Plague has been fairly severe at times in the districts adjacent to Amoy and other places in China and in the Orient, but no case has occurred in the Philippines either in rodents or human beings for a number of years. For this reason this service takes careful precautionary measures in order to prevent its introduction by the medium of vessels or their cargoes.

#### OUTGOING AND CONSULAR QUARANTINE.

The consular quarantine function is performed in the Philippine Islands in the same manner in which it is carried out by American consuls stationed at foreign ports. This work is carried out by the quarantine service in addition to the regular quarantine work. The Philippines are not a menace at the present time to continental United States, but being in the Orient, where bad sanitary conditions have existed in the past, certain restrictions are imposed to meet the sanitary demands of the home Government as well as to insure a constant observance of the law and thus safeguard importations into the United States.

General statistics in this connection are here shown:

Bills of health issued.....	235
Crew inspected.....	23,922
Passengers inspected, cabin.....	7,244
Passengers inspected, steerage.....	19,752
Pieces of cargo inspected and certified.....	6,745,158
Vessels disinfected and fumigated.....	40
Vessels inspected.....	217

#### DISINFECTION OF VESSELS.

The number of vessels disinfected at the various quarantine stations in the Philippine Islands was less this year than for some time. The improved sanitary conditions prevailing in the port cities should reduce the number of disinfections required year by year. Vessels were, however, disinfected on account of having cholera, smallpox, suspected plague, leprosy, tuberculosis, and measles aboard. Such vessels as were used by the Government in carrying lepers to the colony at Culion were disinfected by this service as heretofore. A great number of small river craft were also given appropriate treatment by the service when cases of communicable diseases occurred on board while engaged in lightering of vessels in the harbor, as a protection to the personnel of the vessel, and as aid to the local health administration.

#### EXAMINATION MADE FOR INTESTINAL PARASITES.

The work of former years of making laboratory examinations of arriving immigrants to determine the presence of hookworm was continued during the year. Cholera organisms and intestinal parasites were also included in the examination. In this work there were 3,428 stool specimens examined, of which 615 were found to be positive for some variety of intestinal parasite and 2,813 were reported negative. In this examination no cholera carriers were detected during the year. Among the positive specimens the showings were as follows: Seventeen specimens contained hookworms, 255 ascaris, 305 trichiuris, 40 double infection of ascaris and trichiuris, 1 trichiuris and hookworm, 1 ascaris and hookworm, and 1 triple infection of hookworm, ascaris, and trichiuris.

#### PHYSICAL EXAMINATIONS.

There was a total of 395 physical examinations made at the several ports of the Philippine Islands. The local law governing the granting of licenses to ships' officers requires that every applicant be physically sound, in addition to the examination for hearing, vision, and color sense. This complete physical examination is made of all applicants for the first license. Examinations for renewal of licenses usually consist only of tests for color, hearing, and visual acuity.

The examinations made during the year were as follows:

Port.	Deck officers.	Engineer officers.	Total.
Manila.....	193	114	307
Iloilo.....	4	5	9
Cebu.....	23	56	79
Total.....	220	175	395

One board was convened for the examination of a commissioned officer of the service for promotion.

#### FUMIGATION OF VESSELS AND RAT QUARANTINE.

The continued fumigation of vessels at the ports in the Philippine Islands has accomplished a notable diminution of the number of rats found on vessels. The semiannual fumigation of interisland vessels has been continued. Vessels on the Hongkong-Manila run were fumigated regularly; and since the reappearance of plague in Hongkong fumigation is required every other trip. The number of rats killed is as follows:

	Manila.	Cebu.	Iloilo.
Number of rats.....	826	316	84
Number of mice.....	134	67	16

#### MEDICAL INSPECTION OF ALIENS.

The medical inspection of aliens in the Philippines is conducted by the quarantine officers on duty in the Philippines in addition to their quarantine work. Aliens arrived at all the parts of entry and the inspections were made on board arriving vessels, or at the immigration stations, or in the quarantine office. The movement of aliens to and from the Philippine Islands is considerable. Certain nationalities whose home country is adjacent to the Philippines travel to and fro in considerable numbers so that it is difficult upon arrival at Philippine ports to at once segregate those who are new arrivals from the domiciled aliens who on returning can not be considered in the same class as when first arriving. For this reason it has been necessary to have the immigrants identified by the immigration officials before they are examined. The inspections for the year have been about the same in number as for the past two or three years; and the certifications have been mainly for trachoma and hookworm.

#### SMALLPOX.

Smallpox has been epidemic in several points adjacent to the Philippine Islands. A very severe outbreak prevailed in Hongkong for a considerable period, reaching its height the last week of December, 1917. Smallpox was not introduced into the Philippine Islands from the outside, as far as could be determined by careful investigation. A shipwrecked crew of Moros picked up by a local vessel bound for Manila was the means of introducing a case which was treated at the pest house. Local cases could be traced to this source.

In the Philippines an outbreak of smallpox occurred, and has persisted over a limited area for some time, occurring principally among children who had not been vaccinated and a number of adults who have recently moved to the cities, probably from parts of the islands where general vaccination had not been complete, or such as had been vaccinated with vaccine which was inert. It is very diffi-

cult in a continuously warm country to preserve the vaccine with full potency when it is necessary to transport it many days to remote points distant from rapid means or transportation. The outbreak seemed to be most severe in the vicinity of Manila. Investigation shows that the cause of this outbreak was entirely local and not due to importation from any other country. The Philippine health service took every possible measure commensurate with its limited resources for the control of the outbreak and extermination of the disease. The officers of the service rendered every possible aid and one officer was detailed for duty in connection with the suppressive measures taken to control the outbreak and was later placed in charge of the smallpox hospital in Manila. The outbreak has declined and a normal condition will obtain at an early date. During this outbreak the crews and steerage passengers of all vessels leaving for the United States were vaccinated; and the crews of all interisland vessels were also revaccinated.

#### CHOLERA-CARRIER SURVEY AND SANITATION OF INTERISLAND VESSELS.

One of the most important pieces of work which was carried out by the service during the year was the continual inspection of interisland vessels and local draft for the purpose of maintaining a proper sanitary condition and to prevent as far as practicable the occurrence of communicable diseases on such vessels. This work included not only seagoing and interisland vessels but also the small lighterage vessels and launches in the ports of entry. Together with such inspections the periodical fumigations were carried out; all the members of the crews were vaccinated, and stool examinations were made to determine the probable presence of cholera carriers. The number of vessels so inspected and reinspected was large. The number of specimens taken and examined in the cholera-carrier survey totaled 939, all of which proved negative for cholera organisms.

#### RATS IN CARGO.

Observations were continued during the present year along the lines previously reported with regard to rats arriving from foreign ports in cargo. The warehousemen do not confirm the general opinion that many rats are transported in packed cargo. In fact it was impossible to obtain one positive occurrence where rats were actually present in imported cargo. The campaign to provide rat-proof containers for loosely packed vegetables, crockery, and articles packed in straw and baskets has had a very satisfactory measure of success. Nearly all of the baskets in which vegetables, fruits, and crockery are now being shipped from the China coast are of such a character that the openings, or meshes, are too small to allow the passage of small rats or even mice.

With regard to rats gaining admittance to cargo while en route on the steamers, one fortunate feature in Philippine ports is the very short time consumed by the voyage, which scarcely gives rodents either the opportunity, or the necessity, of attacking or entering packed cargo; and this may be one explanation why it is found that cargo of a type which naturally should be rat infested seems to be here almost, if not entirely, rat free. The continual fumigation of

vessels, thus reducing the number of rats on board far below the ordinary available food supply, also diminishes the liability of rats finding it necessary to obtain their food supply from the cargo on board.

## AID TO OTHER SERVICES.

The service in the Philippine Islands was able during the year to be a positive aid to a number of other services of the Government, such as disinfecting of vessels infected with cattle diseases for the bureau of agriculture; physical examination of officers applying for licenses in the steamboat service, dispensary aid for injured and sick employees, medical inspection of and medical aid for arriving and detained immigrants, and loan of transportation facilities to the bureau of customs; sanitary supervision of vessels anchored in the river and canals of the port cities, disinfection of leper-carrying vessels, furnishing of launch transportation, furnishing services of medical officers on special work, to the Philippine health service; operating the dispensary for the employees of the engineer island shops and marine railway of the bureau of commerce and industry; inspection and passing of the certificates of origin of meat and meat products arriving from foreign countries for the board of food and drug inspection; physical examination of cadets for admission to the Government nautical school; furnishing sanitary data and bills of health for members of the foreign consular service; displaying typhoon signals for the weather bureau; maintenance of a light for navigation purposes near the Mariveles quarantine station for the lighthouse establishment; medical treatment of enlisted men and officers for the bureau of constabulary; as well as other minor services rendered the Army, Navy, Coast and Geodetic Survey, and the insular bureaus. During the patrol necessitated by war conditions the quarantine station at Mariveles has been used by the Navy for a number of official purposes, and the station at Cebu was used for an extended period to house-interned prisoners of war.

## CAVITE AND OLONGAPO.

The Cavite and Olongapo inspection stations are operated for the convenience of the United States Navy in order that naval vessels arriving can be inspected without first calling at an established port of entry. The quarantine work is in charge of surgeons of the Navy who have been detailed to perform the duties of quarantine officers of the port.

The transactions for these ports for the fiscal year 1918 were as follows:

## Cavite:

Vessels inspected .....	34
Crew inspected .....	2,992
Passengers inspected, cabin .....	66
Passengers inspected, steerage .....	103
Bills of health issued .....	12

## Olongapo:

Vessels inspected .....	4
Crew inspected .....	516
Passengers inspected, cabin .....	4
Passengers inspected, steerage .....	0
Bills of health issued .....	4

## CEBU QUARANTINE STATION.

Considerable activity from the quarantine standpoint was obtained at the quarantine station on Cautit Island as well as in the quarantine office in the customhouse at Cebu. At the close of the last fiscal year the station was being used as a detention camp for interned sailors from German vessels which had remained at that port since the beginning of the present world war. They were later sent to the United States.

During the year the island of Cautit was officially set aside as a quarantine reservation by Executive order of the President.

In addition the quarantine anchorage was established by the Surgeon General in accordance with law and regulations.

The transactions of Cebu for the year are partly shown by the following statistics:

Vessels inspected from United States ports	27
Vessels inspected from foreign ports	63
Vessels disinfected on account of diseases	4
Vessels in quarantine	4
Vessels fumigated	80
Crew inspected on arriving vessels	4,911
Cabin passengers inspected on arriving vessels	85
Steerage passengers inspected on arriving vessels	333
Persons detained in quarantine under observation	144
Persons vaccinated at quarantine	90
Cases of cholera at quarantine station	4
Cases of smallpox at quarantine station	1
Seamen examined for licenses	79
Bills of health issued for vessels for foreign ports	27
Bills of health issued to vessels for United States	63
Interisland vessels inspected in port	260

## ILOILO.

The office of the service at Iloilo was moved into the new customhouse, occupying quarters specially arranged for service use when the building was erected. Iloilo is maintained as an inspection station at the present time. Steam disinfection facilities are not available. Although the apparatus is on hand there is no building as yet for its installation and operation. An effort is being made to obtain for this purpose one of the structures on the abandoned military reservation of Fort San Pedro, negotiations to that end are in progress.

The energies of the quarantine officer were used in endeavoring to prevent the introduction of plague and cholera from near-by foreign ports, at some of which the diseases named were present during the entire year. Vessels which arrived with cholera and smallpox on board were given appropriate treatment. In the city of Iloilo a few cases of cholera and also a few cases of smallpox occurred during the year; and, as heretofore, the city has remained entirely free from malaria.

The operations of the service may be tabulated as follows:

Vessels inspected	26
Vessels disinfected and fumigated	199
Vessels in quarantine	5
Crew inspected	1,124
Passengers inspected, cabin	50
Passengers inspected, steerage	128
Persons bathed and effects disinfected	41



Cases of quarantinable diseases detected.....	5
Bills of health issued.....	63
Sanitary inspection interisland vessels.....	232
Pieces of cargo certified.....	311, 421
Seamen examined for licenses.....	10

## JOLO.

At Jolo the shipping arriving for the year was normal in quantity as compared with former years. One vessel arrived with a case of sickness on board which very closely resembled plague, and the vessel and personnel were treated accordingly. Later the case proved not to be plague. Vessels arrive at Jolo almost exclusively from the ports in Borneo and the Straits Settlements.

The quarantine transactions for the year were as follows:

Vessels inspected.....	26
Bills of health issued.....	24
Crew inspected.....	1, 554
Passengers inspected, cabin.....	92
Passengers inspected, steerage.....	571

## MANILA.

Vessels arriving at the port of Manila are inspected in Manila Bay adjacent to the piers and breakwater, some vessels anchoring outside the breakwater and awaiting inspection, others proceeding direct to their regular buoys. No arriving vessels are inspected at the piers. Two launches are kept in commission for boarding and general incoming and consular quarantine work. The service has offices in the customhouse, and from the Manila office the operations of the service in the entire archipelago are supervised by the chief quarantine officer.

Some of the transactions of the Manila station are included in the following table:

Vessels inspected from United States ports.....	104
Vessels inspected from foreign ports.....	439
Vessels disinfected on account of disease.....	23
Vessels in quarantine.....	23
Vessels disinfected and fumigated.....	177
Vessels given sanitary inspection in port.....	211
Crew inspected on arriving vessels.....	49, 853
Cabin passengers inspected on arriving vessels.....	9, 854
Steerage passengers inspected on arriving vessels.....	29, 027
Persons detained in quarantine under observation.....	1, 219
Persons vaccinated at quarantine.....	16, 627
Applicants for marine licenses examined.....	307
Stools examinations made for hookworm.....	3, 428
Stools examinations made for cholera carriers.....	939
Bills of health issued for United States ports.....	194
Bills of health issued for foreign ports.....	405

## MARIVELES QUARANTINE STATION.

The Mariveles quarantine station during this fiscal year maintained its record for efficiency, but there was not as much actual detention and disinfection work accomplished as in some previous years. The custom of granting pratique to vessels at Mariveles has been discontinued and all vessels are required to receive their pratique at the usual anchorage of the port to which the vessel is destined. A free dispensary was maintained at this station for the poor inhabitants of

the town of Mariveles and the adjacent Province of Bataan. The sanitation of the municipality of Mariveles was also unofficially supervised, and during the year some additional improvements, such as public laundry and toilets were installed, and the population was revaccinated.

Trespassing and attempted establishment of residences and cultivation of land on the mountain watershed of the station water system made it necessary to request that said watershed, which is public land, be withdrawn from lease or settlement. A survey is being made, and it is anticipated that no difficulty will be encountered in having the watershed, which is a mountain cañon, so reserved.

A portion of the operations of the station may be comprehended by the statistics shown in the following table:

Vessels calling at the station for treatment-----	7
Vessels disinfected or fumigated-----	5
Persons bathed and effects disinfected-----	204
Pieces of baggage disinfected-----	322
Persons vaccinated-----	2, 721

#### ZAMBOANGA.

At Zamboanga a number of the largest liners are now calling on their way to and from Australia and Japan. There is also the smaller vessels that ply between the ports of Borneo and the Straits Settlements. The quarantine work has been conducted as heretofore, and fortunately no infected vessels arrived during the year.

The statistics of the work during the year at Zamboanga may be tabulated as follows:

Vessels inspected-----	36
Bills of health issued-----	32
Crew inspected-----	2, 067
Cabin passengers inspected-----	657
Steerage passengers inspected-----	1,732

#### CURRENT APPROPRIATIONS.

For the calendar year 1918 the Philippine legislature appropriated the sum of \$62,000 for the current expenses of the quarantine service, divided as follows: Salaries and wages, \$44,250; contingent expenses, \$17,000; and fixed assets, \$750. There remained on hand from the first half of the calendar year 1917 the sum of \$29,622.19, and an additional appropriation of \$5,462 was provided by the emergency board to offset the increase in the cost of supplies, particularly fuel for launches. There, was, therefore, a total of \$66,084.19 available for the year under report.

It was not possible to obtain an appropriation for the repair, maintenance, or construction of buildings and wharves.

#### *Financial statement, Philippine quarantine service.*

##### GENERAL CURRENT APPROPRIATION.

##### Debits:

Appropriation, act 2672, balance on hand July 1, 1917-----	\$29, 622. 19
Appropriation, emergency board-----	5, 462. 00
Appropriation, act 2727, allotment six months-----	31, 000. 00

66, 084. 19

**Credits:**

Expend during fiscal year ended June 30, 1918.....	\$60,330.93
Reverted to Treasury December 31, 1917.....	3,528.06
Unexpended balance June 30, 1918.....	2,225.20

66,084.19  
2,225.20

Outstanding obligations June 30, 1918.....

## EXPENDITURE BY STATIONS.

General service expenses.....	\$20,309.58
Launch expenses.....	8,942.23
New station equipment.....	410.89
	29,662.70

**Mariveles:**

General service expenses.....	9,833.98
Repairs to building and wharf.....	3,767.81
Launch expenses.....	775.26
New construction and equipment.....	293.44
	14,670.49

**Iloilo:**

General service expenses.....	2,534.25
Launch and barge expenses.....	2,822.89
New station equipment.....	8.73
	5,365.87

**Cebu:**

General service expenses.....	5,639.29
Launch expenses.....	4,111.53
Repairs buildings and wharves.....	241.11
New construction and equipment.....	56.99
	10,048.97

**Zamboanga:**

General service expenses.....	360.00
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**Jolo:**

General service expenses.....	222.90
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60,330.93

## NAPLES, ITALY.

Surg. Carl Ramus reports as follows for the fiscal year ending June 30, 1918:

*Statistics of the service at Naples, Italy.*

Ships.	Emigrants.		Baggage.	
	Inspected.	Embarked.	Inspected.	Disinfected.
87	2,237	2,219	2,042	2,324

## REJECTIONS RECOMMENDED.

Trachoma.	Suspected trachoma.	Other causes.	Total.
13	2	3	18

*Statistics of the service at Palermo, Italy.*

Ships.	Emigrants.		Baggage.	
	Inspected.	Embarked.	Inspected.	Disinfected.
1	23	21	24	6

*Statistics of the service at Palermo, Italy—Continued.*

REJECTIONS RECOMMENDED.

Trachoma.	Favus.	Other causes.	Total.
2	0	0	2

*Emigrants from Levant for the United States held in observation at the detention house, Naples, During the fiscal year ending June 30, 1918.*

Number in observation.	Number embarked.	Recommended for rejection.	Not embarked for reasons other than medical.	Still under observation June 30, 1918.
1,238	1,246	10	31	11

*Typhus fever in Italy during the fiscal year ending June 30, 1918.*

Province.	City.	Date.	Cases.
Macerata.....	Moravalle.....	July 1, 1917.....	1
Porto Maurizio.....	San Remo.....	Feb. 25 to Mar. 3, 1918.....	2
Cuneo.....	Bagnasco.....	Mar. 24 to Apr. 7, 1918.....	3
Naples.....	Naples.....	Apr. 29 to May 5, 1918.....	1
Bari.....	Molfetta.....	May 13 to June 23, 1918.....	25
Bari.....	Corato.....	May 20 to June 23, 1918.....	3

*Relief given by service at Naples during the year ending June 30, 1918.*

OUT-PATIENT OFFICE.

Relief given.	Number of cases treated.	Number of times treated.
American seamen and soldiers.....	68	136
American Red Cross staff.....	21	55
British seamen and soldiers.....	85	134
Italian seamen and soldiers.....	28	57
Total.....	202	382

ITALIAN WAR REFUGEES.

Refugees relieved.	Number of cases treated.	Number of times treated.	Vaccinations.
For the American Red Cross, Feb. 12 to June 30, 1918.....	430	969	144
For Italian authorities, Nov. 9, 1917, to June 30, 1918.....	766	2,722	5,217
Total.....	1,196	3,691	5,361

PUBLIC HEALTH IN ITALY.

The health news from official sources indicates that during the fiscal year ended June 30, 1918, the public health of Naples, and throughout Italy generally, has been satisfactory, notwithstanding the greatly increased hardships imposed on the civil population by war conditions

Cerebrospinal meningitis has been present in many parts of Italy, but never in epidemic proportions. Source of information is the Official Bulletin of Infectious Diseases, issued by the director general of public health. From this data Acting Asst. Surg. Enrico Buonocore has prepared a set of tables for the principal Italian cities, giving, in addition to the figures for the disease in each city, the numbers of the civil population, according to the census for 1911. There were 1,936 cases for all Italy from July 1, 1917, to June 23, 1918. The greatest number of cases occurred in the month of May, 1918. Most of the cases were reported from the large cities, whose populations are augmented in war time by thousands of soldiers coming and going. Out of the 1,936 cases there are no statistics as to the number of deaths. The use of serum therapy is said to have given better results than during the previous year.

#### SMALLPOX.

Smallpox has been present in many Italian cities, but never in epidemic proportions. The largest number occurred at Turin, where there were 202 cases from October 22, 1917, to June 23, 1918. There was an outbreak at Mezzojuso, Province of Palermo, with 107 cases from May 4 to June 23, 1918. It was still in progress, but diminishing, when the last reports were received. There were 10 cases at Naples during the fiscal year. The total number of cases for all Italy from July 1, 1917, to June 23, 1918, was 2,504. The number of deaths is not obtainable. See table.

#### TYPHUS FEVER.

The official records show that typhus fever was present at six Italian cities during the fiscal year. One case occurred at Naples on April 29, 1918. The total number of cases for the six cities was 35. The deaths are not reported. See table.

Information was recently received that typhus fever had appeared in Libia, Africa, among several camps for prisoners of war and rebels, and among the Arabian population. Numerous cases are said to have occurred. Under military discipline the outbreak was controlled and localized in the original foci of infection. There were two deaths among the sanitary force, and many among the other victims, but when this report was written statistics were not yet available as to cases and deaths.

#### WORKERS FROM LIBYA AND CIRENAICA.

Six hundred and eighty-seven workers from the Italian colonies of North Africa were disembarked at Naples. Before leaving the African ports they were vaccinated against plague, cholera, smallpox, and typhoid, and they were bathed to destroy body vermin. On arrival at Naples they were again bathed, and their baggage and clothing disinfected. The majority had trachoma. After discharge from quarantine they were distributed in groups to several cities to work in plants under Government supervision.

#### CONDITIONS IN THE LEVANT.

On July 8, 1917, the Italian sanitary authorities officially declared the port of Port Said, Egypt, plague-infected. On this account and

because of information received through the Bulletin Mensuel of the Office International d'Hygiene Publique, Paris, June, 1917, as to the prevalence of plague at Aden, Suez, and Port Said, and the case of the steamship *Sardinia* at London from Australia with five cases of plague; it was decided to require fumigation to destroy rats of all vessels bound for the United States via Suez Canal and Naples. The option was given either of fumigation at Naples or at United States ports of arrival. A circular letter conveying these requirements was sent to the steamship agents and others concerned. Report was made to the bureau in letter dated July 23, 1917.

The official consular reports from Athens and Pireus invariably state that no official records are available for developments of quarantinable diseases. But semiofficial reports from time to time tell of cholera, plague, typhus, and small-pox at various Greek and Albanian ports. In the absence of definite and regular official reports the Italian authorities wisely regard the entire Levant as continuously infected with the quarantinable diseases. Steerage passengers from Levantine ports are always detained at least five days and their baggage disinfected, they are also bathed and treated to destroy body vermin, and when it is believed that they have actually been exposed to typhus fever they are detained 12 days. All steerage passengers from the Levant are also examined bacteriologically to determine whether they are cholera carriers. They are also vaccinated.

Many steamers arrive at Naples from British Indian ports, most of them carrying grain. If dead rats are found while in Italian ports, they are examined bacteriologically by Italian officials. If they deem the vessels suspicious of plague infection, they are required to be fumigated with sulphur dioxide after discharging. The usual rat guards are required to be placed on lines of ships from plague-infected ports. Traps are placed in the dock warehouses, and of the rats caught all are killed and half the number examined bacteriologically.

#### UNITED STATES OUTGOING QUARANTINE.

British Indian ports are regarded as permanently plague-infected, also Egyptian and other Levantine ports. Vessels from all these ports, bound for United States ports via Naples, are investigated as to itinerary and sanitary history before bills of health are issued. Fumigation with sulphur dioxide to destroy rats and other vermin is required prior to sailing; but where masters or agents object to fumigation, notation is made on the bill of health recommending that it be done at the United States port of arrival.

Vessels from Australia and other safe ports, having traversed the Suez Canal prior to sailing for the United States via Naples, are subjected to the same requirements, as there are reasons for believing that such vessels while in the canal are exposed to conditions which might permit rats to get aboard.

Steerage passengers arriving at Italian ports from the Levant are invariably detained at least five days by the Italian authorities, their stools are examined for vibrios, and their baggage is disinfected. An officer of the United States Public Health Service supervises the disinfection of baggage destined for the United States. If steerage passengers come from ports known to be infected with typhus fever, the period of detention is extended to 12 days by the

Italian authorities, with special attention to the destruction of body vermin.

#### EMIGRANTS FROM THE LEVANT FOR UNITED STATES.

The number of emigrants from the Levant arriving in Naples was 1,298, of which 1,246 embarked for the United States. Among these persons six were found by the Italian sanitary authorities to be carriers of vibrios, which disappeared from the stools of all within 20 days. There were also two cases of smallpox and three of measles. All were bathed and vaccinated. See table.

#### OUT-PATIENT OFFICE.

During the fiscal year the American Red Cross has furnished the service out-patient office at the American consulate with an examining table, instruments, surgical gauze and cotton, bandages, and emergency medicines. The service officers have treated 202 cases of sickness and injury and have given relief 382 times during the year. The beneficiaries were officers and men of the American and allied merchant marine, of the naval services, soldiers, aviators, and officers and men of the American Red Cross.

Expenses incident to the treatment of American seamen and military men are referred to the American consulate, which has authority from the Department of State to settle such bills. Expenses in the cases of allied seamen and military men are borne by their respective Governments. The personal services of the officers of the United States Public Health Service are given gratis to American and allied seamen and soldiers and to the American Red Cross staff. In addition to examination, advice, and treatment given at the out-patient office, the service officers have frequently visited and treated seriously sick men on board their vessels, and at the International Hospital.

#### WAR REFUGEES.

After the disaster of Caporetta many thousands of refugees from the invaded Provinces began to pour into Naples and southern Italy generally. There was then a serious shortage of physicians and surgeons at Naples, on account of the exigencies of military and naval service.

The general food and fuel situation, which had been bad enough for many months past, immediately became much worse. German and Austrian agents and sympathizers took advantage of the psychological crisis created by the recent defeat and food and fuel shortage to foment trouble among the lower classes. In the presence of a situation potentially dangerous to American and allied interests the officers of the United States Public Health Service at Naples felt it to be their duty to offer their services to the Italian authorities, as far as they could be given without interfering with their routine duties. Their offer was made in writing and at once accepted.

On November 9, 1917, the service officers at Naples entered into cooperation with the civil and naval authorities at Naples in the medical and surgical care of war refugees. The majority of the refugees arriving at Naples were quartered in the large emigrant barracks, from which they were later distributed to other places in southern Italy and Sicily. The better classes were accommodated in

two large vacant hotels. Daily visits were made by the service officers to two of the places mentioned; the third being under the charge of the Italian Red Cross.

During March, 1918, the American Red Cross relieved the Italian authorities of the burden of caring for the war refugees under the charge of the Italian Red Cross. On February 12, 1918, the director of the American Red Cross at Naples requested the service officers to take over the medical service of the war refugees under his charge, releasing the Italian Red Cross surgical staff for other work.

Realizing the extreme importance as war work of all measures bringing relief to the severely tried civil population of Italy the service officers complied with the request of the American Red Cross and assumed the additional duty of taking charge of their medical service at Naples, they having no medical officers available for the work.

In sum, the service officers at Naples have been cooperating with the Italian civil and naval authorities in the daily medical and surgical care of Italian war refugees from November 9, 1917, to June 30, 1918; and with the American Red Cross from February 12, 1918, to June 30, 1918. At the end of the fiscal year 1,196 cases had been treated; relief had been given 3,691 times, and 5,361 vaccinations made. The total number of refugees arriving at Naples was 24,029. The diseases found among the refugees on arrival were: Smallpox, 2 cases; measles, 4; bacillary dysentery, 4; amœbic dysentery, 1; pellagra, 3; œdema of feet and leg, large numbers. During their domiciling at Naples several cases of typhoid and paratyphoid developed, which were apparently due to infected milk, as there is no efficient official supervision over the milk supply, at least during the war. The water supply of Naples is said to be above suspicion. At the end of the fiscal year the number of war refugees at the two hotels, now under the medical supervision of the service officers, was practically unchanged, though the number at the emigrant barracks was considerably smaller.

#### VENEREAL DISEASE PROPHYLAXIS.

While naval vessels usually have obligatory instructions or regulations concerning prophylaxis against venereal disease, American and allied seamen of the merchant marine have been almost entirely overlooked, with the bad consequences as to disease and efficiency which always follow such neglect. In order to meet this deficiency as far as possible at the Naples station during the war, simple, brief, and definite instructions were printed and distributed to seamen and military men who applied for treatment at the out-patient office maintained by the United States Public Health Service at the American consulate. The American consul cooperated by giving copies of the instructions to masters and officers visiting the consulate on official business. The British consul general also cooperated most efficiently by having 1,000 copies printed at his own expense for distribution among British seafaring men.

When crews are medically inspected prior to departure for United States ports, the service officer making the inspection gives a brief talk to the men on venereal disease, and leaves copies of the prophylactic instructions. Furthermore, Acting Asst. Surg. Buono-core made an Italian translation of the prophylaxis instructions,



which were then published in the *Gazzetta Internazionale di Medicina, Chirurgia, Igiene, etc.*

## PUBLIC HEALTH SERVICE PROPAGANDA.

In the effort to promote international understanding and cooperation in practical sanitation, Acting Asst. Surg. Buonocore has translated into Italian many articles by officers of the United States Public Health Service, Army and Navy. His translations have been accepted and published in the leading Italian medical journals.

## ADDITIONAL DUTIES.

At the request of the American naval attaché at Rome, the service officer at Messina certifies to the crew lists of all vessels sailing from that port for the United States. These crew lists are made out in triplicate, one being sent to the United States naval attaché at Rome, one being consigned to the master of the vessel, and one being retained by the service officer at Messina.

## OPERATIONS OF THE SERVICE IN PORTO RICO.

Service operations in Porto Rico for the fiscal year embraced, as in the previous year, quarantine, out-patient, and marine-hospital relief, medical inspection of immigrants, medical inspection of seamen, and miscellaneous duties.

## QUARANTINE.

The service maintains quarantine stations at San Juan, Ponce, Mayaguez, Aguadilla, Fajardo, Humacao, Arroyo, Arecibo, Guanica, and Jobos (Central Aguirre).

Medical inspection of alien passengers and seamen is made at all of these ports, but hospital relief is furnished only at San Juan and Ponce.

Quarantine is the most important phase of the service operations in Porto Rico. The medical officer in charge at San Juan is the chief quarantine officer of Porto Rico, and has under his supervision and direction all quarantine matters at the subports. At San Juan is maintained the only quarantine station in Porto Rico, located on Miraflores Island, in San Juan Bay. It is equipped with quarters, disinfecting and fumigating apparatus, etc. An administrative office is located in San Juan, in the old naval station, occupying a commodious building belonging to the service. Here are located also the out-patient dispensary and a small station laboratory.

*Fumigation of vessels.*—Under the provisions of bureau circular of August 4, 1913, vessels from certain ports have been fumigated before being allowed to dock. They are mostly small sailing vessels from West Indian ports. Sulphur is usually used, but lately hydrocyanic-acid gas has been satisfactorily substituted in several special instances.

Other vessels from ports included in the provisions of this circular which make Porto Rican ports only as ports of call, which have heretofore been prohibited from docking, but were permitted to transact business while at anchor in the bay, by special authority from the bureau—in order to expedite shipping and to minimize the

delay in port—were allowed to go alongside of the pier, but stringent requirements were exacted of all such vessels toward taking necessary precautions to prevent rats being carried ashore.

Vessels coming within the requirements of fumigation at six months' intervals are fumigated at San Juan, or at a United States port, as may be convenient.

*Fumigation of cargo.*—The fumigation of cargo for rats, which was put in force during 1913, has been continued. At San Juan sulphur or hydrocyanic gas is used; at Ponce and Mayaguez, sulphur.

*Special yellow-fever measures.*—The restrictions previously observe against certain ports in Venezuela, which were held to be endemic centers of yellow fever, upon bureau approval were removed. Two exceptions to this may be noted, the ports of Coro and Maracaibo.

*Outgoing plague quarantine.*—After the eradication of plague in Porto Rico, the outgoing quarantine restrictions were modified on different occasions, until at present the measures are fumigation of vessels for the destruction of rats every six months and the use of rat guards on the lines when vessels are moored alongside of piers.

*Bills of health.*—Bills of health are issued by service officers at Porto Rican ports to all vessels destined to ports in the United States. By authority of the bureau, ships plying between the Virgin Islands and Porto Rico were not required to obtain a bill of health.

*Smallpox.*—Occasional cases have been reported from various points in Porto Rico throughout the fiscal year.

*Typhoid fever.*—There have been occasional cases of typhoid fever reported from around the island throughout the year; since starting the erection of the cantonment, Camp Las Casas, an intensive survey was made to determine the prevalence of typhoid fever, and several foci—one adjacent to the cantonment site—were found; many requests for the prophylactic antityphoid vaccine were received at the out-patient office, and upon permission from the bureau this treatment was extended to the civilian population; over 100 such persons received the series of three inoculations. There is great need of sanitary work being done around the cantonment site in order that the health of the militia might be maintained at the desired high standard.

A great increase of flies, due to insanitary conditions, have been attributed as being the cause of the increased prevalence of typhoid fever; the water is of an excellent quality, the result of a well-operated slow sand-filtration plant located at Rio Piedras.

*Measles.*—Many cases of measles have been reported from the various towns of the island, with a large number of deaths therefrom; however, the situation did not amount to the severe epidemic of the previous year.

*Leprosy.*—Leprosy is endemic in Porto Rico, but the cases are not very numerous. Lepers are isolated on Cabras Island, at the entrance of San Juan Bay, as soon as the diagnosis is positively made. At present there are 40 patients so segregated, 26 men and 14 women.

*Disease on vessels.*—During the fiscal year the following non-quarantinable diseases were found on arriving vessels: Uterine hemorrhage, two cases; lymphadenitis of glands of groin; lymphadenitis of glands of neck; valvular disease of heart (mitral insufficiency);

trachoma; constitutional psychopathic inferiority; Little's disease; cataract of both eyes; typhoid fever; insanity; fracture of bones of hand; chancroid; anemia, simple; internal hemorrhoids; neuralgia of ovaries; atrophic neuritis of optic nerve; cronic catarrhal enteritis; senility and deafness—one case each.

## OTHER OPERATIONS.

Other operations at this port have been routine matters, such as marine-hospital relief, medical inspection of seamen, medical inspection of aliens, physical examinations for able-bodied seamen, medical advice to persons rejected for military duty, marine-hospital relief to enlisted men of the United States Navy and United States Marine Corps attached to the local wireless station, which are given in the statistical table under their proper headings.

At the request of the Commissioner of Immigration medical attendance was given to the Dutch seamen on vessels in port taken over by the United States Shipping Board until they could be transferred to New York.

The service made over 400 physical examinations for the Navy of applicants for enlistment.

## PLAGUE ERADICATION.

No human or rodent plague has been reported in Porto Rico during the year.

The laboratory examination of rodents has been continued by the sanitation service of the insular Government. The weekly statements from July 1, 1917, to June 29, 1918, show 5,370 rats and 1,654 mice examined with negative results.

The majority of these rodents were caught in San Juan and the suburbs of Puerta de Tierra and Santurce.

*Report of annual transactions at San Juan and subports of Porto Rico for the year ended June 30, 1918.*

[Not quarantinable diseases at any of the ports.]

	San Juan.	Ponce.	Mayaguez.	Aguadilla.	Humacao.	C. Aguirre.	Arecibo.	Arroyo.	Guanica.	Fajardo.	Total.
Total inspections:											
Vessels.....	324	57	67	1	4	13	.....	1	183	54	704
Crew.....	13,877	2,121	1,851	8	65	467	.....	9	6,353	343	.....
Passengers.....	16,583	2,768	773	.....	.....	.....	.....	.....	290	210	.....
Total personnel inspected.....	30,460	4,889	2,624	8	65	467	.....	10	6,553	523	.....
Vessels passed on certificate of ship's medical officer.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Vessels from infected ports.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Infected vessels.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Number of cases.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Number of crew detained.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Number of passengers detained.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Personnel disinfected.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Personnel examined.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bacteriologically or vaccinated vessels fumigated.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Number of vessels detained for observation or treatment.....	22	.....	.....	.....	.....	.....	.....	.....	1	.....	23
Number of rats destroyed on ships.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Rats examined.....	83	.....	.....	.....	.....	.....	.....	.....	.....	.....	83

## PROGRESO, MEXICO.

Acting Asst. Surg. H. E. Gimler reports that during period April 1 to June 30 there cleared from Progreso for ports in the United States some 67 vessels, of which number 54 were fumigated prior to sailing for the purpose of mosquito destruction.

One case of yellow fever was reported in Merida, Yucatan, the case resulting fatally April 12, 1918. Since that date no reports as to yellow fever prevalence have been made.

## SHANGHAI, CHINA.

Acting Asst. Surg. S. A. Ransom reports for the year ended June 30, 1918, a decrease in quarantine operations in comparison with those of previous years. Shanghai, according to official reports, has been free from rodent or human plague for a period of more than two years, and in view of this fact vessels complying with the requirements as to fending-off, rat-guarding, and mooring lines have been permitted to discharge cargo from alongside wharves. In general, however, it has been the practice to require vessels to go into stream and from registered lighters they are periodically fumigated.

As formerly, vessels and the personnel are inspected, as nearly as possible, at the hour of sailing, and bill of health has been issued at the time of such inspection. The sanitary condition of the port is about the same as in former years, apparently good, with the exception of a sharp rise in the incidence of smallpox. Scarlet fever and cerebrospinal meningitis both occurred in epidemic form, while typhus, relapsing fever, beriberi, and rabies appeared sporadically. There was no plague or cholera.

The water supply and disposal of sewage has been fully investigated with the view to improvement, but the findings of the expert in charge of the investigation are not yet available for consideration.

The disinfection and fumigation of cargo in vessels and the bathing of personnel whenever necessary is generally performed by the Shanghai Disinfecting Co. This company has a rather large plant for steam disinfection, equipment for the generation and pumping of sulphur dioxide or carbon dioxide into vessels and also a supply of pots and pans for the generation of sulphur gas on board vessels. Fumigation of vessels is generally performed by the latter process. In instances, however, where it has been necessary to fumigate partially loaded vessels, carbon dioxide gas has been used with apparently great satisfaction in so far as one may judge from the number of dead rats collected after the fumigation.

During the year there were inspected 166 vessels with a total personnel of 14,179. Thirty-nine vessels were fumigated for rodent destruction, and 366 harbor lighters were also fumigated for the same purpose.

## TAMPICO, MEXICO.

Acting Asst. Surg. E. W. Gill was in charge of service transactions at this port from July 1, 1917. Transactions from November 30 to October 1, 1918, were under the supervision of Asst. Surg. M. S. Lombard.

Upon the resumption of outgoing quarantine in the spring of 1918, Acting Asst. Surg. E. W. Gill was in charge of the service operations. The number of vessels inspected were 731, of which number 434 were fumigated by the destruction of mosquitoes immediately prior to departure.

The expense of fumigation of vessels has been borne by the shipping interests. Practically all of the fumigation performed was accomplished by the use of cyanide gas. Fumigation procedure was carried out under the supervision of a service representative (an ex-employee of the service), who had previously become well versed in the practice of cyanide fumigation at New Orleans.

The employment of cyanide fumigation at Tampico has resulted in a very material benefit to shipping by reducing the detention on oil-carrying ships; it also proved to have a greater range of practicability, and has eliminated the hazards of fire which formerly obtained when these vessels were fumigated with sulphur by the open pot and pan method.

#### TUXPAM, MEXICO.

Acting Asst. Surg. A. J. Hoskins reports that there has been a considerable improvement in the sanitary condition of the port, due to the efforts on the part of the various oil companies, who employed a sanitary force at their own expense. During the year there were inspected 171 vessels, carrying a total crew of 6,869; no passengers. One hundred and one vessels were fumigated prior to departure for the destruction of mosquitoes.

#### VERA CRUZ, MEXICO.

Acting Asst. Surg. L. B. Cooke was in charge of service operations from July 1, 1917, to October 31, 1917. On resumption of service operations in the spring of 1918, Acting Asst. Surg. J. A. Hedrick was assigned to duty at Vera Cruz. Twenty-seven vessels were inspected, none of which were fumigated for the destruction of mosquitoes.

#### THE VIRGIN ISLANDS.

Pursuant to a request from the Secretary of the Navy that the United States Public Health Service take over the administration of the maritime quarantine service of the Virgin Islands, Surg. W. W. King was sent to St. Thomas July 24, 1917, under orders to report to the governor for duty as quarantine officer.

At that time the quarantine service had continued as under the Danish Government; the former regulations were yet in force and the Danish quarantine officer had continued to act in that capacity under the American administration. Naval medical officers at Christiansted and Frederiksted, on the island of St. Croix, in the places of the Danish officers who had returned to Denmark, were acting as quarantine officers at those ports.

Under the Danish Government the quarantine administration was a local affair; that of St. Thomas being under the municipality of St. Thomas and St. John, and that of Christiansted and Frederiksted

under the municipality of St. Croix. The regulations for St. Thomas were promulgated in 1889 but had been modified from time to time as occasion demanded. No copy of the St. Croix regulations has been found, but they are said to be practically the same as those of St. Thomas. Although under separate administrations the quarantine officers at the different ports worked in cooperation and followed about the same procedure.

With the exception of very specific instructions upon certain points, the quarantine regulations were worded in general terms, leaving details very largely to the discretion of the quarantine officer or to special orders from higher authority according to the particular need. In general the methods of quarantine inspection were similar to those of the United States Public Health Service, but omitted some phases of inquiry into the sanitary history of the vessel and cargo. Very meager records were kept.

In lieu of salary the quarantine officers were allowed to retain the fees collected for boarding vessels to the amount of \$1,500 yearly, as well as extra fees for night visits, visits to vessels outside the harbor, and for medical attendance to persons at the quarantine station. From his collections he was required to provide and maintain a boarding boat and boatmen. The Danish quarantine officer at St. Thomas remained in office under the American administration under the same status as formerly. In St. Croix, owing to the departure of the Danish officials, naval medical officers have acted as quarantine officers in addition to their other duties.

It was necessary to retain the existing regulations in effect until the necessary steps could be taken for the transfer of the quarantine function to the Federal Government. In the meantime Surg. King was named chief quarantine officer of the Virgin Islands, and the quarantine officers at the three ports were directed to report to him in quarantine matters. Various details of the inspection of vessels were modified to conform more closely to service methods, the operations at all ports was made uniform, and the service forms for records and reports were put into use August 1, 1917.

The transfer of the quarantine function from local administration to the Federal Government was finally accomplished by an Executive order dated September 27, 1917. By virtue of that Executive order the United States quarantine laws and regulations were put into effect on November 1, 1917, superseding the Danish regulations. The Danish quarantine officer at St. Thomas retired, but the boarding fees continue to be collected in accordance with paragraph 23 of the ordinance of October 23, 1885, which was continued in force by the act of Congress, March 3, 1917. In accordance with the above ordinance these fees are turned into the colonial treasury.

The ownership of a small amount of property, such as furniture, bedding, and miscellaneous articles from the former quarantine station was not transferred to the Federal department, because its title is vested in the harbor board of St. Thomas and the question has been raised as to the legality of its transfer. It is probable that this property will be eventually transferred, but in the meantime it has been placed in the custody of the quarantine officer for use as may be needed.

The small quarantine station formerly maintained at St. Thomas by the Danish Government has been occupied for military purposes,

hence it is no longer available for use as a quarantine station. There were no station facilities at the other ports. A site has been recommended for a new quarantine station at St. Thomas, together with designs and recommendations for buildings and equipment.

At present only inspection service is in operation at these ports. Under the former regulations vessels from the United States and Porto Rico were required to undergo inspection upon entering Virgin Islands ports, but this has not been done since the United States quarantine regulations were put into effect. Small vessels could be fumigated with sulphur should the emergency arise, and a small number of persons could be held in quarantine by the establishment of a temporary camp, using equipment from the old quarantine station and what might be obtained temporarily from other services or purchased in the local market. Large vessels or a larger number of persons to be detained would have to be remanded to the station at San Juan, P. R.

Boarding of vessels at St. Thomas is now being done by the service officer, while at Christiansted and Frederiksted the naval medical officers continue to act in that capacity. There are no civilian physicians in St. Croix available as acting assistant surgeons.

Under the Danish regulations vessels from the neighboring British Virgin Islands were specially exempted from quarantine inspection, and upon investigation it was recommended and approved that the exemption be contained. These vessels are numerous small sailboats of from 3 to 5 tons, carrying live stock and provisions, and as many as 20 have arrived at St. Thomas in one day. As long as no quarantinable disease exists in those islands these small boats have no practical quarantine importance and arrangements were made with the British health authorities for reciprocal notification of the appearance of quarantinable disease in those islands or St. Thomas.

St. Thomas has for many years been an important shipping center but the number of vessels inspected has greatly diminished since the beginning of the war, and this number was further lessened when vessels from the United States and Porto Rico were admitted without inspection. Vessels inspected and passed at one port are not re-inspected at another port of the Virgin Islands.

When the American Consular Service ceased operations in the Virgin Islands, on account of transfer of sovereignty, the function of issuing consular bills of health was taken over by the customs service. This duty was transferred to the quarantine officers on August 1, 1917.

For the 11 months ended June 30, 1918, quarantine transactions at St. Thomas included the inspection of 234 vessels with an aggregate personnel of 10,913. At Christiansted during this period there were inspected 16 vessels with a total personnel of 241. At Frederiksted 36 vessels were inspected with a total personnel of 3,212.

#### COOPERATION WITH THE NAVAL GOVERNMENT OF THE VIRGIN ISLANDS OF THE UNITED STATES.

In August, 1917, Surg. W. W. King, quarantine officer at St. Thomas, Virgin Islands, was named as member of a board, with Lieut. Commander W. R. White, United States Navy, and Surg. C. S. Butler, United States Navy, to investigate and report, with recom-

mendations, upon the sanitary status of the Virgin Islands of the United States. This board visited the three islands of the group and made a thorough investigation of the conditions on each. An exhaustive report was rendered dealing with the question under three general heads: (1) Social and economic conditions affecting health and sanitation; (2) the public medical services, such as municipal hospitals, dispensaries, midwife service, etc., and the diseases, prevalent; and (3) the existing state of sanitary affairs.

In this investigation many social and industrial conditions, racial characters, certain customs of long standing, and habits of living were found to have adverse influence upon sanitation. Topography and climate were generally favorable in their effects when advantage would be taken of them. Very bad economic conditions and commercial depression were prominent causes of undernourishment and poor housing. The poverty of the people compels them to resort to public medical service which is inadequate to meet the demands upon it. Hospitals were underequipped and poorly supplied with materials and personnel. Certain transmissible diseases were prevalent and the death rate, especially among children, was abnormally high. Sanitation was in an extremely primitive state. Privies were in common use and badly cared for; the water supply was from cisterns which were seldom screened, hence from these two sources flies and mosquitoes were numerous. Various lines of sanitary work were practically untouched.

In November, 1917, Surg. King was made chairman of the health commission (board of health) of the municipality of St. Thomas and St. John, and as its executive officer he thus became in effect health officer of the municipality. Health work was at that time practically confined to routine sanitary inspection of streets, yards, gutters, etc., and the supervision of the burning of garbage and refuse at the public dumping grounds. The entire sanitary force consisted of two inspectors and two laborers. The available funds were only sufficient to pay these employees, and there were none for sanitary work.

The first move undertaken was a sanitary survey of the town of St. Thomas. A house-to-house canvass was made, and upon a card were noted the data concerning the house and its occupants, yard, outbuildings, etc. The cards when completed and checked up were finally filed for reference. The location of the houses and data regarding excreta disposal and water supply were spotted in various-colored inks and different symbols on a map of the town to give a graphic picture of these conditions and the interrelation of those at one house with those at the neighboring houses.

This survey included certain suburbs of St. Thomas which were practically parts of the town, at any rate, from a sanitary point of view. In all, 1,956 cards were filled out, showing very valuable information which was found very useful in the sanitary operations immediately undertaken and was the basis for estimates of more extensive future work.

Before the time of completion of the sanitary survey a new form of reporting transmissible diseases was inaugurated by the medical service in St. Thomas. The daily reports were sent to the health officer, where the location of the cases was spotted on a map of the



town to show their grouping and relation to one another. The action in regard to the case was noted on the report, which was sent to the central office for file.

The knowledge of the presence and location of these cases enabled the health officer to take what measures were possible with the limited means at hand. The first reports received were cases of acute poliomyelitis, of which five cases were reported as occurring during a period of about one month. No connection could be traced from one case to another nor to any original source. No further spread of the disease occurred.

A number of cases of chickenpox were traceable to earlier cases, and the disease had evidently been prevalent for some time. Strict quarantine was not attempted, but parents were directed to keep the patients at home and away from other children. Later the prevalence of the disease was declining. Of mosquito-borne diseases, a few cases of malaria were reported originating out of town. Also some cases of filariasis. Dengue was not often reported at first, but later the number was markedly increased, probably due to an increase of susceptible material in the persons of recently arrived Americans. Mosquitoes were breeding abundantly in water barrels, cisterns, etc. Antimosquito measures, although not provided for by the sanitary regulations, were undertaken usually in connection with other sanitary work, and met with no opposition.

Typhoid fever reports showed a marked increase in June, 30 cases in all being reported in two and one-half months. Investigation of the cases in relation to food, water, milk, etc., the grouping of the cases, and manner of spread all pointed to the fly as the agent of transmission. Flies were prevalent throughout the town, breeding principally in privies, which were generally insanitary in some respects. Practically none were fly proof. Antityphoid measures were directed chiefly toward correcting insanitary conditions of privies and yards, particularly to eliminate fly breeding places and to prevent flies from gaining access to organisms deposited in the privies. Antimosquito work, principally screening, was done at the same time.

At other places where repairs or reconstruction were going on, owners were instructed to carry out certain sanitary provisions. At the close of the fiscal year, sanitary work of various kinds had been completed on 50 properties, and was yet incomplete at 57 more places. All this sanitary work had been carried out by the property owners at their expense, and while small in amount, it is that much more than would have been done otherwise. It is probable that it has had some effect in limiting the spread of disease, but marked results can not be expected until the work becomes more generalized and is done on a larger scale, as contemplated by the estimates and plans submitted for the next fiscal year.

#### MEDICAL INSPECTION OF ALIENS.

During the fiscal year ended June 30, there were examined by medical officers of the United States Public Health Service 278,736 immigrants for the purpose of detecting disease and physical or mental defects in accordance with the provisions of the United States immigration laws. This number of immigrants examined, as

compared with 528,648 for the previous year, shows a decrease of 249,912. The number of immigrants certified for disease or physical or mental disabilities was 13,434, in contrast with 20,261 so certified during the preceding year.

In addition to the immigrants examined there were also inspected 450,421 alien seamen as provided in the act of February 5, 1917. Of this number 5,384 were certified to as having a physical or mental defect. The medical examination of alien crew has been particularly onerous, and has not only prevented the detachment of officers from immigration work which otherwise would have been possible on account of the very great reduction in immigration, but has necessitated the detail of additional officers. The full effect of the alien crew inspection probably will not be felt until after the European war shall have terminated, and the normal movement of vessels carrying crews from several hundred to a thousand members shall have been reestablished. The peculiar conditions under which medical inspection of crews has to be conducted makes the procedure especially difficult. This inspection of seamen has to be carried out on board ship and under conditions far from conducive to efficiency. The impracticability of having all alien seamen assembled at one point for medical inspection, such as is done in the inspection of steerage passengers, greatly adds to the magnitude of the work. Formerly, a small force of medical officers was sufficient for performing the medical inspection of aliens on board vessels; that is, first and second class passengers and such alien seamen as had indicated their desire to land. Cargo ships which carried no passengers were boarded by medical officers who had ample time to attend to any matters concerning the medical inspection of aliens and return to the boarding cutter while it was still alongside. In this way, the medical officers were not required to stay on board the usual tramp or freight steamer but could successively board a number of this class of vessels. Under the new law all this has been changed. The inspecting officer has to remain with the vessel in order to properly conduct the medical examination of the alien crew. In view of this added requirement, therefore, it seems probable that the medical force at New York will have to be doubled when normal commerce shall have been reestablished, and proportionately increased at other ports.

At some of the ports a saving of administrative effort was effected by having the medical examination of alien seamen performed by the quarantine officer, while the vessel was at the quarantine station. Theoretically, this practice was open to some objection since service officers have no plenary powers in enforcing immigration laws or regulations. In practice, however, the plan operated very smoothly. From the standpoint of exclusion of undesirable immigrants, it may be stated that the results of medical inspection during the past year were decidedly unsatisfactory. In some of the ports of the country, of the total number certified as having mandatorily excludable diseases or defects, not more than half were excluded. This undesirable situation arose, in part at least, from the difficulties attending deportation.

Transfer of the immigrant hospitals at Ellis Island from the Labor Department to the War and Navy Departments also resulted in a material increase to the administrative burden of the medical

officers. When the transfer was made, the Labor Department presumably considered that it would be able to secure sufficient hospital space in various New York City hospitals for the reception and care of sick aliens. In a manner this has been done but only by scattering the patients among a number of hospitals at widely scattered points. At one time there were some 15 sick aliens distributed to 11 separate hospitals. This naturally caused a very considerable dissipation of administrative effort on the part of the medical force engaged in reexamination of diseased immigrants.

The policy of the Labor Department in causing the hospitalization of alien seamen suffering from mandatorily excludable ailments of an acute nature until cured also materially increased the duties of the medical officers assigned to this class of work. While the medical examination of alien crew may result in some benefit, nevertheless, it is quite apparent that under the present system the administrative effort in securing these results is out of proportion to the good accomplished.

The number of officers assigned to the medical inspection of immigrants has varied during the year, but on an average some 75 officers were exclusively engaged in this duty. In addition to this a number of service officers stationed at marine hospitals and quarantine stations also performed medical examinations of aliens. The various officers stationed at consulates in foreign ports likewise made physical examinations of intending immigrants in order that the latter might be aware of any conditions which would operate to their exclusion, and also in order that the shipping agent might be advised of any defect that would tend to prevent the admission of aliens into the United States. This function as carried out at foreign ports tends to prevent loss of time and money to the alien, and it is likewise of some assistance to steamship companies in avoiding penalties provided in the United States immigration law against common carriers for bringing in certain defective aliens.

*Aliens inspected and certified at all ports and places in the United States and its dependencies and in Canada.*

Number of aliens examined.	Aliens certified.				Total.	Tuber- culosis.	Insan- ity.	Idiocy.	Imbe- cility.	Epi- lepsy.	Feeble- mind- ed.	Favus.	Syph- ills.	Soft chan- cre.	Gonor- rhea.	
	Class A. (1)	Class A. (2)	Class B. Disease or de- lect which con- tains or affects danger- ability con- to earn tagious, a living.	Class C. Disease or de- lect of loss de- gree.												
Astoria, Oreg.	110															
Baltimore, Md.	23, 100	9	413	612	1, 345	9	5			2			79			218
Biscayne Bay (Fla.) quarantine.	2, 287															
Blaine, Wash.	93	3	1	9	17		1	2								1
Boston, Mass.	25, 142	5	136	409	834	83		1					2	22		26
Brownsville, Tex.	4, 607	24	242	567	874	6	1			1	2		1			1
Brunswick, Ga.	608		3		3											
Buffalo, N. Y.	6, 772	54	21	797	1, 118	3	11	14		9			6			10
Calais, Me.	71			1	1											
Calcutta, Cal.	530		26	5	35	1										
Charleston, S. C.	2, 279		6	1	8	1										
Chicago, Ill.	49			4	3	7										
Del Rio, Tex.	2, 535	2	6		9		1				1					8
Detroit, Mich.	3, 756	46	17	507	701	4	8	7	3		4	20				1
Douglas, Ariz.	4, 116	3	6		5						3					
Duluth, Minn.	2, 938	1		18	47	66										
Eagle Pass, Tex.	11, 593	18	26	23	95	17	7	1	1	3	1		6			42
Eastport, Idaho	1, 282	9	2	263	281	1	5			1	3		1			1
El Paso, Tex.	24, 339	22	30	92	166	2	12	3		1	5	7	16			2
Everett, Wash.	6				6	6										
Galveston, Tex.	7, 668	1	11	8	24		1						1	1		6
Gloucester, Mass.	257	1	2	4	10	17										2
Hallifax, Nova Scotia.	4, 863	12	9	66	84	5	3				1		1	4		3
Hidalgo, Tex.	3, 016			145	145	143										
Honolulu, Hawaii	4, 299	2	94	140	240	94	1			1	3					
Houston, Mo.	32			2	7											
Houston, Tex.	165	2		32	35		1									
International Falls, Minn.	1, 654															
Ketchikan, Alaska.	33, 255															
Key West, Fla.	22, 750	2		1	3		1	1	1	1					2	1
Laredo, Tex.		7	39	147	320	36	1									



*Aliens inspected and certified at all ports and places in the United States, its dependencies and Canada.*

#### ALIEN SEAMEN INSPECTED AND CERTIFIED.<sup>1</sup>

	Inspected.	Certified.	Important diseases for which certification was made.										
			Trachoma.	Tuberculosis.	Insanity.	Idiocy.	Imbecility.	Epilepsy.	Feeble minded.	Favus.	Syphilis.	Soft chancre.	Gonorrhea.
Baltimore, Md. ....	22, 768	1, 332	9	5	2	.....	.....	2	.....	.....	77	106	210
Boston, Mass. ....	21, 312	551	.....	.....	.....	.....	.....	.....	.....	.....	2	22	25
Buffalo, N. Y. ....	182	33	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newport News and Norfolk quarantine. ....	42, 327	488	184	9	2	.....	.....	.....	.....	2	53	37	90
New Orleans, La. ....	17, 161	489	47	4	.....	.....	.....	1	.....	1	75	70	85
New York, N. Y. ....	166, 833	772	241	17	8	.....	.....	6	1	.....	56	98	195
Pensacola, Fla. ....	1, 431	37	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	8
Reedy Island quarantine. ....	26, 728	1, 043	66	7	.....	.....	.....	.....	1	.....	14	49	48
Port Townsend, Wash. ....	18, 155	100	7	.....	.....	.....	.....	.....	.....	.....	20	12	18
San Francisco, Cal. ....	47, 039	34	11	.....	.....	.....	.....	.....	.....	.....	10	4	3

<sup>1</sup> Statistics are given only for the larger seaport stations.

#### REPORTS FROM IMMIGRATION STATIONS.

##### BALTIMORE.

Surg. J. A. Nydegger reports as follows:

Owing to conditions due to the war the number of aliens arriving at the port of Baltimore continued at a minimum during the year, consisting mainly of alien seamen who, upon reaching the port, sought discharge from their vessels and subsequent admission in the usual way, generally for the purpose of financially bettering their condition.

The inability to obtain advanced information regarding arriving ships necessitated provisions for the boarding of practically all arriving vessels by a medical officer throughout the year. During the first part of the year it was necessary, on account of the number of vessels arriving, to detail two medical officers for this purpose, one for regular duty, the other for relief duty, owing to the long hours, and also to answer calls when an increased number of vessels arrived and could not be promptly reached by the officer on boarding duty. Toward the middle of the year, the number of arriving vessels having fallen off, due to trade conditions, one officer was able to visit all vessels and perform the medical examinations. Toward the end of the year the number of arriving vessels increased very considerably, and from present prospects will continue to increase so that it will soon be necessary to detail a second officer for boarding duty.

Nine hundred and fifty-one vessels subject to inspection of aliens thereon arrived at this port during the year with a total of 299 (cabin 78, steerage 221) passengers.

There were 299 aliens examined upon arrival. In addition to this number 33 stowaways were examined. Twenty-two thousand seven hundred and sixty-eight alien seamen were also examined.

There were 1,345 regular certificates issued during the year for diseases and physical defects, as follows:

Aliens:

Class (A). Dangerous or loathsome contagious diseases:	
Gonorrhea -----	2
Class (B). Diseases or defects affecting ability to earn a living -----	5

Stowaways:

Class (A). Dangerous or loathsome contagious diseases:	
Gonorrhea -----	3
Syphilis -----	1

Alien seamen:

Class (A). Dangerous or loathsome contagious diseases:	
Syphilis -----	77
Chancroid -----	106
Gonorrhea -----	210
Tuberculosis -----	5
Trachoma -----	9
Tinea barbae -----	5
Epilepsy -----	2
Melancholia -----	2

A large number of the alien seamen recommended for hospital treatment, as also those certified as suffering from venereal diseases who received hospital treatment at their own expense or at the expense of their respective vessels, were subjected to reexamination after discharge from hospitals to determine whether they had entirely recovered.

The accomplishment on board ship of the medical examination of the 22,768 alien seamen during the year was at times performed under extreme difficulties, with long hours on duty, owing to the extensive area of the harbor and to the lack of proper transportation facilities frequently furnished the medical officers for the prosecution of their work. Independent of the above, owing to the closure of navigation of the port for six weeks during the winter season, on account of ice, the officers were obliged to resort to the use of street railways and other methods for reaching the numerous wharves where steamships dock.

The use of the customs cutter by the medical officers for boarding purposes has been continued throughout the year, but owing to the frequent demands made on the cutter for other purposes, and also its frequent laying up for repairs, this convenience has been much interrupted. Eventually it may become necessary to consider the advisability of the officers on boarding duty and the immigrant inspectors to board vessels at the quarantine station.

Previous to May, 1918, the medical examination of alien seamen was confined to those arriving on foreign vessels from foreign ports as also those shipped on American vessels in foreign ports. The amendment to the immigration laws, which became effective in the above month, require the medical examination of aliens shipped on American vessels in domestic ports and subsequently entering a foreign port, upon reentering a domestic port. This requirement will considerably augment the number of alien seamen to be examined annually and consequently will increase the duties of this office.

In the early part of the year a plan was put into effect for taking on board ship specimens of blood for the Wasserman test from alien seamen suspected of having syphilis. The medical officers on boarding duty carried a supply of Keidel vacuum tubes, and by sterilizing

the skin of the arm with tincture of iodine specimens of blood, after a little practice, were obtained very quickly, and with a minimum of discomfort.

The small clinical laboratory in this office should be enlarged in order that more extensive and complete work of this nature can be carried on in the study of the large amount of material available from alien passengers and seamen, and the large out-patient relief work.

The admirably planned immigration hospital at Fort McHenry was completed in January, and was transferred to the War Department, and is now occupied as the surgical wards of Army Base Hospital No. 2.

#### BROWNSVILLE, TEX.

Acting Asst. Surg. S. D. Fairbanks, in charge, reports as follows:

The annual report of the work done for the Immigration Service, during the fiscal year from July 1, 1917, to July 1, 1918, shows 4,607 aliens inspected, of whom 874 were certified for some physical defect. Owing to restrictions of the new immigration law and to war conditions the travel has been considerably decreased compared with previous years. The class of aliens arriving, however, have been much superior to those formerly, and appear more prosperous.

#### BOSTON, MASS.

Surg. M. H. Foster, in charge, reports as follows:

For the fiscal year ending June 30, 1918, 25,142 persons were examined, and 834 certificates were issued. Of these, 3,830 were alien passengers and 21,312 were alien seamen. The percentage of alien passengers certified was 7.3 and of alien seamen 2.6.

Although the number of alien passengers arriving was very much below that of previous years, the duty of inspecting the crews of all vessels from foreign ports, of which there were 558, really increased the work of the station over that of former years.

In addition to the inspection of aliens at Boston it has been necessary to detail a medical officer at various times to proceed to Providence, to Plymouth, to New Bedford, and to other points in the surrounding territory to make physical and mental examinations of passengers and crews.

During the year a large number of alien passengers, warrant cases, and seamen have been detained at the station and kept under medical supervision. Frequently the detention quarters have been badly overcrowded and great care has been necessary to prevent the introduction and spread of contagious diseases among the persons detained here. Various recommendations for their comfort and safety have been from time to time made to the Commissioner of Immigration and in all instances carried out where it was possible to do so with the facilities at hand.

One case of cerebrospinal meningitis, with a fatal result, developed among the passengers detained at the station. Prompt quarantine measures were immediately instituted and no further cases occurred.

It has been necessary to send 193 aliens to different hospitals in the city, and of these 4 have died, 180 have been discharged, and 9 remain at the present time under treatment.



Considerable laboratory work was done during the year. This consisted chiefly of blood examinations for the purpose of detecting carriers of malaria and the making of smears to determine the absence or presence of gonococci in urethral discharges.

About the 1st of April special measures for the detection of venereal diseases among the crews on arriving vessels were instituted and since that time all crews have been especially examined along these lines. The result of these inspections shows a considerable incidence of venereal disease among the alien seamen, but not as large an amount of active gonorrhea or soft chancre as is generally supposed. Recently it has been the practice of the immigration authorities to require all cases of venereal disorders to be taken from the ships and treated in hospitals ashore, thereby greatly diminishing the risk of spreading infection in certain parts of the city proper.

The Commissioner of Immigration and all his subordinates have cooperated fully with the medical force and given valuable assistance in the line inspection.

#### DULUTH, MINN.

During the year just passed 118 boats have arrived and a total of 2,924 passengers inspected.

Comparing year's work with previous years there is a marked decrease in total inspections.

This seems to be due in part to the entry of this country into the world's war and to Canada's strict surveillance of her citizens and the military control of her aliens.

Yet, while the grand total was less the number of conditions certified to increased. There were 66 medical certificates issued as follows: Class A1, 1; class B, 18; and class C, 47. Of this number 9 were deported, class A1, 1, idiocy; class B, 5, chronic pleurisy, gastric ulcer, hernia, right inguinal, loss right eye, and mitral stenosis; class C, 3, infection right thumb, pregnant, and stricture of urethra.

Added to the customary work above is the examination of alien seamen and it bids fair to require as much time as the inspection of arriving aliens. The surgeon is requested to examine these cases on board freight boats at any of the docks along the water front. Also it is required that many people be examined for entry and naturalization.

In conclusion it may be said that although a smaller number of aliens arrived, there were more certifications and deportations than in several years.

And by adding the examination of alien seamen, cases of entry and naturalization, and the moral obligation to serve on board of special inquiry the hours of work have been greatly increased.

#### EAGLE PASS, TEX.

Asst. Surg. C. R. Eskey reports that during the fiscal year ended June 30, 1918, 11,593 alien passengers from Mexico were examined at this port. There were 95 medical certificates issued for physical or mental defects and disease, distributed in the following classes: Class A, 48; class B, 23; and class C, 28. All individuals certified

in class A were deported, while only 18 in the other two classes were returned to Mexico.

The registered traffic from Mexico during the past year was one-third less than reported for the previous year, but the local traffic was nearly twice as large.

The number of certificates issued this year has been reduced somewhat by the fact that over 800 of the aliens examined have been agricultural laborers imported from Mexico who are not eligible for residence in the United States. They are returned after a certain period. Whenever one of these individuals was found suffering from contagious disease the immigration officers were notified and the alien sent back to Mexico. Aliens of this class who were found to have physical defects were allowed entrance, provided the condition would not interfere with his ability to work.

#### EL PASO, TEX.

Asst. Surg. Tappan reports that alien immigration, other than Mexican, has been practically at a standstill at this port during the past year. This, in part due to disturbed conditions in Mexico, has been more apparent since the entrance of the United States into the war.

There has been a fairly steady inward movement of Mexican labor, and, now that the head tax and illiteracy test have been waived for certain classes, it is expected that in the case of agricultural, railroad, and coal-mine workers, who are in the excepted class, there will be many more laborers admitted during the coming year. This may not prove true, however, as agricultural workers were excepted during this fiscal year and only 9,000 were admitted on the whole Mexican border, according to the statistics of the immigration officials. On June 20 the exception was extended to railroad and coal-mine laborers, and there has been a noticeable increase in immigration of these classes.

During the year 24,339 immigrants were examined at the immigration station. There were 16,580 vaccinations performed in the regular routine of immigration work. Certificates for disease or defect, physical or mental, to the number of 166 were issued, as follows: Under class A (1): Insanity, 3; feeble-mindedness, 5; psychopathic constitutional inferiority, 1; epilepsy, 1; tuberculosis, 12. Under class A (2): Leprosy, 2; trachoma, 2; favus, 7; venereal disease, 18; amebic dysentery, 1. Under classes B and C there were issued 92 and 22 certificates, respectively.

Aliens in detention at the immigration station are given medical attention by officers of the service, and, if necessary, are sent to a local contract hospital for treatment. Those presenting evidences of venereal disease are treated for the purpose of rendering them non-infectious as soon as possible. Wassermann tests are made and arsphenamine is administered at the venereal clinic.

#### GALVESTON, TEX.

Surg. R. L. Wilson, in charge of the medical inspection of aliens, reports that immigration has been practically nil on account of war conditions. The total number of passengers examined is 70; seamen, 7,598. Total number of passengers certified, 6; seamen, 18.

Examination of seamen is made on board the vessel immediately after the quarantine inspection and before the vessel docks. On account of the time necessary to make a suitable examination for venereal diseases it may be necessary in cases of vessels with larger crews to make this examination after the vessel docks.

GLOUCESTER, MASS.

Acting Asst. Surg. E. B. Hallett reports as follows:

The duties pertaining to this port embrace the medical inspection of alien passengers and alien seamen. For the fiscal year ended June 30, 1918, there were 257 aliens examined at this port. Of the number examined 29 were certified, as follows: One passenger and 28 seamen. The passenger was certified under class A and the alien seamen under classes B and C.

GLOUCESTER CITY, N. J.

Passed Asst. Surg. Louis Schwartz, in charge, reports:

During the year 415 aliens were examined as immigrants, most of whom were alien seamen applying for formal entry into the United States. The remainder were chiefly aliens who were apprehended because of clandestine entry into the United States.

Alien seamen are examined for immigration purposes by the service officer at Reedy Island, medical examination being carried on in conjunction with the quarantine inspection. Those aliens that are certified by him are reexamined in Philadelphia by Passed Asst. Surg. Schwartz, who countersigns the original certificate and recommends to immigration authorities final disposition of the case. Those requiring hospital treatment are sent to various hospitals by their respective consuls and when discharged are reexamined by the medical officer in charge of medical inspection of aliens.

An effort was made to obtain a ward in a suitable hospital where all alien seamen requiring it could be treated by a service officer at the expense of the respective vessels. While this could not be accomplished at this time, it is hoped that such a procedure may prove practical next year.

All told, there were examined 41,341 sailors, of whom 1,050 were certified, and of these 229 were suffering from mandatorily excludable diseases. The physical standard of sailors in the merchant marine at this time is inferior to that which ordinarily obtains, because a majority of them are men unfit for military duty.

The Gloucester immigration station has been utilized as an internment station for enemy aliens. The medical officer in charge has treated all the sick, regular sick calls being held every morning at 10 o'clock. One thousand nine hundred and sixty patients were treated at the dispensary and 25 in the hospitals. There was one death.

At the request of the commanding officer medical relief was extended the troops on guard at the United States immigration station for the interned aliens. During the year 420 sick soldiers were cared for, of which number 62 were sent to the hospital. All the soldiers on guard and the employees of the Pennsylvania Shipbuilding Co. were inoculated for the prevention of typhoid fever.

A complete set of surgical instruments for the dispensary was provided by the Department of Labor, also a complete X-ray outfit and a steam disinfectant chamber. Sixty-three operations were performed at the Gloucester city immigration station during the year.

It is strongly recommended that a hospital should be constructed at the immigration station, not only as a matter of administration convenience but also for the more efficient care of the sick.

#### HALIFAX, NOVA SCOTIA.

Acting Asst. Surg. T. W. P. Flinn reports as follows:

The service at this station has the honor of submitting the annual report of the medical inspection of aliens destined to the United States for the fiscal year ending June 30, 1918:

Within that period 4,863 aliens were inspected, 171 were certified for diseases or disabilities, as called for by the immigration laws, and one failed to appear for reexamination, showing a material increase in the number of aliens inspected and likewise in the number of medical certificates issued as compared with the previous year.

The number of trans-Atlantic passengers carried by British transports arriving at this port for the year was 92—United States citizens, 15; aliens, 77—classified on shipboard as follows: First cabin, 67; second cabin, 11; steerage, 14.

The above summary gives little idea of the time consumed in meeting and inspecting passengers on board of arriving steamships under war conditions.

The ratio of medical certificates issued to the total number of aliens examined for the year was  $28\frac{2}{5}\%$  as compared to  $33\frac{2}{3}\%$  for the previous year. A fraction of over 1 per cent were deported or returned to Canada, and of the 49 so deported 31 were deported or returned to Canada for diseases that under the law rendered their exclusion mandatory.

The European war conditions still precludes a large arrival of immigrants destined to the United States.

Passenger traffic from this port to the United States was solely by rail, as all ships of coastwise steamship lines were commandeered by the British Admiralty.

The annual report will show that there was a much larger increase in the number of aliens of the border class who sought admission to the United States from this port than in any previous year.

The majority of aliens who applied for admission to enter the United States were Canadian born, of a superior type, both mentally and physically, to aliens of foreign birth who at the time of application were residents of Canada.

By agreement with the Canadian immigration authorities, it is requisite that all males of a military age (18 to 45) presenting themselves before the United States immigration officials for entry to the United States must show a certificate, with photograph attached, signed by the Canadian immigration agent, giving the holder permission to leave Canada.

Since the beginning of the war rarely has the medical examiner been called on to render a certificate for any of the dangerous and

loathsome contagious diseases frequently seen during medical inspections among arriving immigrants, with the exception of venereal diseases, and owing to their increased prevalence, and likewise as this port is a military and naval section, greater vigilance was exercised in the examinations of all aliens, specially those of the seamen class.

In all cases where seamen are destined to the United States and are seeking discharge at this port permission is regularly withheld by the Dominion immigration authorities until the American Immigration Service has examined them and found them admissible and authorized the alien's admission to the United States is the privilege through Canada granted, and then frequently, even in the case of British subjects, the seaman goes forward to the international boundary in charge of a guard detailed by the Canadian Immigration Service. The Dominion's attitude toward seamen destined to the United States results in giving to the United States Immigration Service at this port a very thorough supervision of such seamen.

A number of seamen, applicants for admission to the United States, that ample time is to be had for the medical inspection of aliens at this port by the British Admiralty.

Halifax being a Canadian seaport, no medical inspections were made of the crews of any of the transoceanic steamships, as the new immigration act re "Alien seamen of crews," etc., did not contemplate that trans-Atlantic steamships operating to Canadian seaports should be subjected to any inspection by the United States immigration officers, excepting in instances where crews are leaving steamships and desire to enter the United States. As soon as passenger traffic by steamers direct to United States ports from Halifax is resumed, it will, of course, become necessary for the medical examiner to examine the crews of such vessels contemplated in the immigration act.

On account of the prevalence of a mild type of smallpox during the winter and spring months at this port and many towns throughout the Province, the service representative exercised care for the detection of the disease when examining all aliens destined to the United States.

There was a large number of alien residents of this city who were more or less affected by nervous shock caused by the terrible catastrophe of December 6 last who sought temporary admission to the United States so as to be with relatives and friends and away from the somber scenes of desolation, etc., that followed the explosion.

The service still occupies the same offices as mentioned in previous annual report, though a promise is held out that in the near future quarters will be provided for the American and Canadian Immigration Services in a temporary landing quay building to be erected at the new terminals. At present the Canadian military and British naval authorities are in full control of the trans-Atlantic situation at this port; therefore, it is problematical that any change will be effected as to permanent quarters until after the close of the war.

#### HONOLULU, HAWAII.

A total of 4,185 immigrants were inspected at this port during the year ending June 30, 1918, and 257 were certified for diseases or dis-

abilities in accordance with the immigration law. The majority of arriving aliens were Japanese, the remainder being Chinese and Koreans. The distribution of the medical certificates according to nationality was as follows:

Japanese:	
Class A	87
Class B	124
Class C	12
Chinese:	
Class A	4
Class B	15
Class C	1
Koreans:	
Class A	2
Class B	1
Class C	1
Russian:	
Class A	1

The following are the districts from which aliens arrived from Japan who were found to be afflicted with trachoma, the figures in parentheses representing the number of cases coming from the districts named: Kumamoto (17), Hiroshima (17), Fukuoka (8), Fukushima (8), Yamaguchi (11), Niigata (3), Okinawa (3), Kanagawa (2), Miyagi (2), Korea (4), Kawachi (1), Nagano (1), Yamanashi (1), Ehime (1), Chiba (1), Yehime (1), Kogashima (1), Okoyama (1).

During the year 830 aliens were examined for uncinariasis and none were found to be afflicted with this disease.

Seven fines of \$100 each have been imposed against steamship companies for violation of the provisions of section 9 of the immigration law.

The following summary shows the transactions for the year:

Aliens pending at beginning of year	15
Aliens examined	4,185
Aliens passed	3,928
Aliens certified	257
Aliens deported	72
Aliens landed	191
Aliens pending at close of year	8
Meetings of the medical board	2
Examinations made for uncinariasis	836
Aliens found infected with uncinariasis	0
Aliens treated for other causes at station	31
Aliens treated in hospital	4
Operations performed	2
Fines imposed	7

#### LAREDO, TEX.

Passed Asst. Surg. R. M. Grimm, in charge, reports as follows:

During the fiscal year ending June 30, 1918, a total of 22,750 aliens were examined. Of this number 320 were certified for some disease or defect. One hundred and sixty-three were excluded. With the exception of a small number who patronized a shuttle train operating over the railroad bridge during a portion of the year, all of the aliens were examined at the footbridge.

In addition to the inspection of arriving aliens, the medical officers rendered medical and surgical service to the immigrants held

in detention by the immigration authorities. Although many of these were held in detention for long periods, none of them became seriously ill.

Surg. Edward Francis was in charge of the work of the station until April 24, 1918, when he was relieved by Passed Asst. Surg. R. M. Grimm. Acting Asst. Surg. H. J. Hamilton also served at the station until February 28, 1918, when his services were discontinued by reason of his resignation.

#### MONTREAL, CANADA.

Surg. J. B. Stoner reports as follows:

During the fiscal year ended June 30, 1918, there were 8,184 aliens medically examined at this station, as compared with 12,545 in the preceding year and 16,225 during 1916.

On account of the world war the service work in the medical examination of aliens at Montreal has dwindled mostly to local people and those living near the border in this vicinity, the majority being mechanics, laborers, and farmers, and their families, either seeking admission to the United States or temporary sojourners to the New England States, New York, or other places bordering on Canada.

Several hundred foresters, admitted under bond, for cutting lumber in the woods of Maine and New York, and 305 seamen (included in the above total) for employment on board Great Lakes vessels during the summer months, were also presented for medical examination.

Under date of October 18, 1917, the Department of Labor concluded to grant the petition of the Canadian Pacific Railway Co. for the opening of Malone, N. Y., as a port of entry for Chinese in transit, basing such condition upon the showing that has been made to the effect that the opening of said port is a "war-emergency" proposition. Since then 690 Chinese in transit were medically examined at the immigrant detention rooms of the Canadian Pacific Railway station. All other examinations were made at the United States immigration office daily from 9 a. m. to 1 p. m. and from 2 p. m. to 5 p. m.

During the short days of the winter months after 4 o'clock the examinations were made by aid of artificial light, but any person with suggestively abnormal eyelids or other condition in which there was a doubt as to diagnosis was held for examination on the following day by daylight illumination.

For every person examined the service officer signs a blank form certifying that the alien is either free from disease or that he is afflicted with a certain physical or mental defect or disease.

Thousands of aliens, passengers on board trains from Montreal to the United States, were not presented for medical examination, but were inspected and passed by the immigration officers on duty. These aliens constitute by far the major portion of passenger traffic between Canada and the United States.

#### NACO, ARIZ.

For the fiscal year ending June 30, 1918, Acting Asst. Surg. B. C. Tarbell, stationed at this port, reports 2,096 aliens examined, of

whom 2,070 were passed and 26 debarred for physical or mental defects, as follows:

Under class A (1), insanity, 2; feeble-minded, 2.

Under class A (11), loathsome contagious and dangerous contagious diseases, 13; gonorrhea, 3; syphilis, 6; trachoma, 4.

Under class B nine certificates were issued with nine deportations—leakage of heart, 1; fracture of tibia and fibula, 3; fracture of tibia, 1; fracture of left thigh, 1; fracture of femur, 1; fracture of spine, 2.

Under class C no certificates were issued.

The decrease of aliens applying for admission at this port for the fiscal year just ended, over the preceding year, of almost 5,000 was probably due to the closing of the big copper mines in Cananea, Mexico, for several months this year.

The Southern Pacific Railroad Co. of Mexico has given very good train service this year, all trains arriving during the day, so that ample time is to be had for the medical inspection of aliens at the immigration station.

#### NEW ORLEANS, LA.

During the past fiscal year arriving aliens have been confined mostly to two classes, the nonimmigrant and the foreign seamen, the latter in largely increasing numbers.

At first there was considerable difficulty in making these inspections of foreign seamen, principally due to difficulties of transportation and half-hearted cooperation on the part of those whose duty it was to assist the medical officer in his work.

Repeated recommendations for the proper office and facilities for the examination of seamen were ignored; attention was called more than once that privacy was not only necessary but a right that the seamen could demand, and for other reasons was desirable.

The long wharf front at New Orleans makes it extremely difficult and at times impossible for the medical officer to cover all the arriving vessels as they dock at the wharves in all three parishes, Orleans, Jefferson, and St. Bernard, on both sides of the river from Violet to Avondale, a distance of about 30 miles.

For the past few months agents of vessels have furnished auto transportation to out-of-town points; within the city limits, however, transportation has to be provided by the medical officer making inspection of crews and passengers. Street cars are out of the question owing to poor schedules and distance from the docks. In addition to the examination of arriving alien passengers and seamen there have been a few detained enemy aliens and others at the immigration station, who from time to time require medical attention.

There has been no addition to the equipment at the immigration station, and no attention has been paid to recommendations for drugs, surgical supplies, etc. When any are needed they have to be bought in town for the use of cases under treatment.

A matron is in charge, although a nurse has been recommended. When cases are too ill they are sent to a private hospital for treatment, the medical officer not wishing to assume the responsibility in view of the above-mentioned difficulties.



Space set aside for consultation and treatment rooms, etc., has been converted into a women's dormitory, etc. This makes no provision for examination and treatment of cases or persons, although other quarters are promised in the near future.

Examinations aboard vessels are not at all satisfactory; rooms provided on shipboard are poorly lighted at best and usually badly cramped for space. Crews of ships are examined on board vessels, but if immigrant laborers begin to arrive in large numbers, as indicated, they will have to be examined at the immigration station.

The work at present, owing to the enforcement of rule No. 10, has increased to such an extent that it is beyond the capacity of one man to give it the proper attention.

If properly carried out it will necessitate the detail of additional medical examiners.

NEW YORK, N. Y.

Surg. J. W. Kerr, in charge, reports as follows:

The volume of work connected with the medical inspection of aliens was increased over the previous year, as were the difficulties of its performance. While there was marked decrease in the number of passengers inspected, the number of alien seamen inspected was increased many fold. As will be seen by the included tables, the total number of all classes of aliens was 222,024 in 1918, as compared with 176,133 in 1917; an increase of 45,891.

The difficulties referred to were due (*a*) the discontinuance of line inspection work; (*b*) the making of all inspections aboard ships; (*c*) taking over by the Army of the immigrant hospitals for military patients, resulting in its curtailment for immigration purposes; (*d*) the consequent wide distribution of alien patients among New York hospitals.

On account of these conditions, the character of the inspection work, and the medical care of aliens have not been as satisfactory as in recent years. Neither facilities or time permitted as thorough examination and continued observation of patients as are desirable in this work.

#### ALL INSPECTION MADE ABOARD SHIP.

Since March 8, 1918, practically all inspections of passengers and crews have been made aboard ship. It is impossible under such conditions to conduct as satisfactory examinations as by means of primary line inspection and subsequent consultation.

The practice of having two medical officers examine each certifiable case, therefore, had to be discontinued, except the insanities. This double examination is mentioned in the law, and intended to render insurance doubly sure, but it is doubtful if it does so. Under present conditions the certifying officer assumes the responsibility, and is held strictly accountable. In diagnosing cases he has the advantage of consultation and is urged to avail himself of it.

#### EXAMINATION OF CREWS.

The amount of work involved in examination of crews has been greatly increased. This was due primarily to the act of February 5, 1917, relating to the medical examination of alien seamen. Just as

the outlook for conducting such inspection was becoming adjusted, however, a new problem arose.

Under the act mentioned, and regulations relating thereto, only those seamen aboard American vessels who had signed on at foreign ports were, previous to April 18, 1918, held to be subject to examination. In a recent decision, however, the Supreme Court held that all alien seamen aboard arriving American vessels were subject to the immigration provisions the same as seamen of foreign vessels. This has had the effect of increasing greatly the number of seamen examined and the number of vessels.

The character of disabilities encountered has accordingly changed somewhat. Fewer physical defects and insanities are met with among seamen, while the number of venereal diseases on the other hand is increased greatly.

#### VENEREAL DISEASES AMONG SEAMEN.

Over 15 per cent of all certificates issued during the year was on account of venereal diseases. This proportion is largely in excess of previous years and is accounted for by examinations of crews. While the undue prevalence of this disease among seamen generally is well known, its actual demonstration in such considerable numbers emphasizes the public health and economic aspects as well as the social problems surrounding the sailor's life ashore. In order to ascertain more definitely the extent of this disease among seamen, steps were taken, in so far as possible, to examine thoroughly the crews of vessels.

In accordance with a bureau circular, an endeavor is being made also to treat as many cases as possible among seamen from American vessels. For this purpose conferences were had with the medical officer in charge at the marine hospital, and the practice has been established to refer as many alien seamen from American vessels as possible to that institution for care and treatment.

But the problem still exists because the number of patients largely exceeds the available beds, and practically no other institution provides beds for this class of diseases.

There are estimated to be constantly present in the port of New York about 5,000 seamen, two-thirds of whom are ashore. Medical inspections and dispensary records indicate the need of greater hospital facilities for this class of the population and for the diseases mentioned.

The recent arrangement between the Public Health Service can not correct the situation without these hospital facilities. From both public health and humanitarian standpoints adequate hospital facilities should be provided, preferably in lower Manhattan, by the service in aid of the local authorities in meeting this phase of the venereal disease situation.

#### VISITS TO HOSPITALS.

During the year 108 visits have been made by officers to 18 different institutions in the vicinity of New York for the purpose of examining the physical condition of aliens treated therein in order to determine whether the disease or defect was due to causes prior to landing and whether said aliens could be safely landed or de-

ported. In addition visits were made from time to time to determine the progress of patients under treatment or for purposes of observation prior to certification.

In keeping with the provisions of the Federal compensation act, it has become the established practice to extend relief to all employees of the Public Health Service and the Immigration Service at this station, the latter at the instance of the commissioner of immigration or the superintendent of that service.

#### REDUCED HOSPITAL FACILITIES.

On March 8, 1918, the immigrant hospital at Ellis Island was requisitioned by the War Department for the reception of military patients. This necessitated the transfer of the majority of the hospital personnel to other Public Health Service stations, including those assigned to the laboratory, which was also transferred, for the time being, to the War Department.

The patients in hospital at the time of the transfer, of which there were 122, were transferred to other institutions as follows: Fifty-one Navy patients, to the Navy; 4 soldiers, to the Army; 15 insane aliens, to a private sanitarium; and 16 trachomatous aliens, to the Manhattan Eye, Ear and Throat Hospital. The remaining number were held at the immigrant hospital pending discharge on account of recovery or other disposition.

Subsequently, arriving aliens requiring observation and treatment have had to be sent to various hospitals throughout New York and Bayonne, N. J. On account of war conditions the facilities of these hospitals has been strained to such an extent that it was impossible for the immigration authorities to secure accommodations for all the alien patients in two or three institutions.

It is expected that the method of admission to the hospitals and the visits of medical officers will become systematized so as to facilitate the observation and care of patients. The present situation emphasizes, however, the necessity of well-organized hospital facilities in the medical inspection of aliens.

The above applies also to laboratory facilities which are not now available, advantages being taken, therefore, of the facilities at the marine hospital when it is practicable to do so.

#### 'MEDICAL CONDITIONS ARISING OUT OF THE WORK.

In addition to the closer observation to detect venereal affections, consideration has been given to certain disabilities, particularly neurosis and penetrating wounds likely to be encountered in greater degree by reason of the war. Changed conditions in respect to immigration will likely continue long after the war. It is the purpose to anticipate these changes and in due time to recommend additional personnel and facilities with which to meet those of a medical nature.

The general work accomplished during the year is presented below in tabular form.

During the year passengers and crew arrived at New York from foreign ports as follows:

Aliens in cabin.....	32, 377
Aliens in steerage.....	22, 814
Total aliens.....	<u>55, 191</u>

Citizens (cabin)-----	20, 065
Citizens (steerage)-----	1, 628
Total citizens-----	21, 693
Crew-----	166, 833
Grand total, aliens, citizens, and crew-----	257, 707

*Medical certificates.*

Class A (1), including 1 imbecile, 18 insane, 14 feeble-minded, 2 constitutional psychopathic inferiority, 3 epileptics, 6 alcoholism chronic, and 20 aliens certified for tuberculosis-----	64
Class A (2), loathsome contagious, or dangerous contagious disease-----	164
Class B, disease or defect which affects ability to earn a living-----	1, 095
Class C, disease or defects of less degree-----	31

*Disposition of immigrants certified.*

Class A (1) :	
Cases pending at beginning of year-----	36
Cases certified during year-----	64
Total to be accounted for-----	100
Cases deported-----	36
Cases landed-----	40
Cases pending close of year-----	24

Class A (2) :	
Cases pending at beginning of year-----	28
Cases certified during year-----	164
Total to be accounted for-----	192
Cases deported-----	87
Cases landed-----	91
Cases pending close of year-----	14

Class B :	
Cases pending at beginning of year-----	60
Cases certified during year-----	1, 095
Total to be accounted for-----	1, 155
Cases deported-----	110
Cases landed-----	1, 030
Cases pending close of year-----	15

Class C :	
Cases pending at beginning of year-----	None.
Cases certified during year-----	31
Cases deported-----	None.
Cases landed-----	31
Cases pending close of year-----	None.

*Disposition of cases certified during the fiscal year ending June 30, 1918, including cases pending from preceding fiscal year.*

	From preceding year	Certified.	Total.	Deported.	Landed.	Remaining.
Class A (1)-----	36	64	100	36	40	24
Class A (2)-----	28	164	192	87	91	14
Class B-----	60	1, 095	1, 155	110	1, 030	15
Class C-----		31	31		31	
Total-----	124	1, 354	1, 478	233	1, 192	53

*Report of alien seamen certified.***Class A (1):**

Constitutional psychopathic inferiority.....	1
Alcoholism, chronic.....	4
Feeble-minded.....	1
Epilepsy.....	6
Insane.....	8
Tuberculosis.....	17
<b>Total.....</b>	<b>37</b>

**Class A (2):**

Sycosis barbae.....	3
Syphilis.....	56
Gonorrhea.....	195
Chancroid.....	98
Trachoma.....	241
<b>Total.....</b>	<b>593</b>

**Class B:**

Positive Wassermann reaction.....	20
Organic disease of nervous system.....	2
Beriberi.....	3
Organic disease of heart.....	1
Valvular disease of heart.....	12
Arteriosclerosis.....	1
Varix.....	2
Bronchitis, chronic.....	1
Malaria, chronic.....	2
Rheumatism, acute.....	1
Bronchial asthma.....	1
Hernia.....	30
Locomotor ataxia.....	1
Paralysis of leg.....	1
Arthritis, chronic.....	1
Deformity of arm.....	1
Deformity of hand.....	2
Deformity of nose.....	1
Deformity of chest.....	1

**Class B—Continued.**

Deformity of legs.....	1
Dislocation of shoulder.....	1
Dislocation of hip.....	2
Atrophy of leg.....	1
Shortness of leg.....	1
Lameness.....	2
Loss of arm.....	1
Loss of hand.....	1
Loss of fingers.....	1
Loss of leg.....	1
Loss of foot.....	1
Ankylosis of hip joint.....	1
Ankylosis of knee joint.....	2
Curvature of spine.....	4
Osteomyelitis.....	1
Iritis, both eyes.....	1
Inflammation glands of neck, chronic.....	1
Inflammation glands of groin, chronic.....	3
Inflammation of shin bone.....	1
Adenitis inguinal.....	1
Hydrops of knee.....	1
Epithelioma skin of face.....	1
New growth of face, malignant.....	1
Psoriasis.....	1
Fracture of ankle.....	1
Deafness.....	3
Defective vision.....	2
Blind one eye.....	7
Poor physical development.....	1
Senility.....	10
<b>Total.....</b>	<b>140</b>

**Class C:**

Orchitis.....	1
Alcoholism, acute.....	1
<b>Total.....</b>	<b>2</b>

NOTE.—Members of crews are returned to their ships. In event permission to land is requested, they are handled as alien passengers and are reported in the general list.

*Medical and surgical report of diseases in the United States immigrant hospitals, New York, during the fiscal year ending June 30, 1918.*

	From preced- ing. year.	Ad- mitted.	Total.	Recov- ered.	Im- proved.	Not im- proved.	Died.	Re- main- ing.
Total immigrants.....	98	1,438	1,536	935	240	328	16	17
Interned German seamen.....	13	68	81	43	27	7	4	.....
<b>Total.....</b>	<b>111</b>	<b>1,506</b>	<b>1,617</b>	<b>978</b>	<b>267</b>	<b>335</b>	<b>20</b>	<b>17</b>

*Causes of death in aliens.*

Tuberculosis, chronic pulmonary.....	6
Neuritis, multiple.....	1
Insane.....	1
Valvular disease of heart.....	2
Otitis media, chronic.....	1
Mercury poisoning.....	1
Pneumonia, lobar.....	2
Pneumonia, broncho.....	1
Meningitis, cerebral.....	1
Total.....	16

*Causes of death in interned Germans.*

Tuberculosis, chronic pulmonary.....	2
Tumor, malignant throat.....	1
Valvular disease of heart.....	1
Total.....	4

*Races of immigrants deported on medical certificates during fiscal year ending June 30, 1918.*

Races.	Adults.		Children.		Total.
	Male.	Female.	Male.	Female.	
African (black).....	26	9	2	1	38
Armenian.....	1				1
Assyrian.....		1			1
Cuba.....	2				2
China.....	7				7
Dutch.....	2				2
Denmark.....		3			3
England.....	7	1			8
East Indian.....	1				1
Finnish.....	5				5
France.....	5	1			6
Flemish.....	1				1
German.....	3				3
Greece.....	17	3	1		21
Hebrew.....	2				2
Irish.....	2	1			3
Italy (North).....	3				3
Italy (South).....	9	6			15
Japan.....	3				3
Maltese.....	3				3
Mexican.....	4				4
Norway.....	11				11
Porto Rican.....	1				1
Polish.....	1				1
Portuguese.....	8				8
Russian.....	1				1
Sweden.....	9	1			10
Spain.....	57	4			61
Syrian.....	5				5
Uruguay.....	1				1
Wales.....	1				1
West Indian.....	1				1
Total.....	199	30	3	1	233

*Summary of hospital transactions fiscal year ending June 30, 1918.*

Number of patients in hospital at beginning of year.....	111
Number of patients admitted to hospitals (immigrant and contagious) during year.....	1,506
Total treated <sup>1</sup> (men, 1,183; women, 240; male children, 101; female children, 93).....	1,617
Births (male, 2; female, none).....	2

Deaths (men, 13; women, 4; male children, 2; female children, 1)-----	20
Pay patients treated during year-----	1, 419
Free patients treated during year-----	198
Number of days' treatment, pay patients-----	29, 796
Number of days' treatment, free patients-----	5, 346
Total number of days' treatment for hospital cases-----	35, 142
Maximum number of patients in hospital at any time during year-----	162
Daily average number of patients in hospital-----	96
Number of patients in hospital at end of year-----	17

Hospitals.	From pre- vious year.	Admit- ted.	Total treated.	Recov- ered.	Im- proved.	Not im- proved.	Died.	Re- main- ing.	Days treat- ment.
Immigrant.....	96	1, 249	1, 345	776	230	310	12	17	33, 142
Contagious.....	15	257	272	202	37	25	8	.....	2, 000
Total.....	111	1, 506	1, 617	978	267	335	20	17	35, 142

## PENSACOLA, FLA.

There were 1,431 alien seamen examined at the station during the fiscal year ending June 30, 1918, of whom 37 were certified.

The examination of alien seamen as carried out consists of a rather more comprehensive inspection than that used in the usual quarantine procedure. The personnel of the vessel are required to appear singly before the medical officer at some desirable point on the ship. The alien is then ordered to bare his body from the axillae to the ankles. By this means many certifiable conditions are found that would otherwise be overlooked. The time consumed is somewhat in excess of that necessary for the quarantine measures usually employed, but since the vessels arriving at the port of Pensacola, Fla., are not numerous, and the sailing vessels predominating, the crews therefore being few in number, and no passengers being carried, the method has proven satisfactory, both as to results obtained and to time consumed.

## PHILADELPHIA, PA. (REEDY ISLAND QUARANTINE STATION).

Passed Asst. Surg. J. R. Hurley reports as follows:

During the year there were inspected at this station 26,728 alien seamen; 22 stowaways and 81 alien passengers. Of the alien seamen examined 1,043 were certified to as having some physical or mental defect.

The total number of arriving aliens, and the total number of defects certified is not a true index of the absolute number of different aliens inspected, nor of different defects found. The reason for this being that under the new immigration law all aliens, the crew included, on an arriving vessel must be examined each time they enter here, and this notwithstanding the fact that they may have been signed on in this country. For instance, certain ships may be regularly engaged in traffic between Philadelphia and a certain foreign

<sup>1</sup> Included in total number of patients treated in hospital:

Interned Germans-----	81
United States soldiers on guard-----	30
United States sailors on guard-----	129

port, say in South America, Mexico, or the West Indies, carrying fruit, oil, or nitrates. The vessels in question may each make from 4 to 12 round trips in a year. While there is a certain amount of changing of personnel, a large percentage of the same crew may remain aboard throughout the year. This means that certain aliens, with perhaps certain defects, such as hernia, may arrive and be examined a half a dozen times during the year with the same defects existing being certified over and over again each time the vessel arrives. This would obviously tend to swell the apparent number of arriving aliens as well as the apparent number of defects certified.

It might be of interest to state that the Philadelphia immigration office is well satisfied with the present arrangement of examining aliens on arrival at this station, as it is understood that it is the first time in the history of the port that all aliens have been detected and examined with so little trouble to that office. Hitherto arriving ships that went to some other port, dock, or place on the Delaware River other than the docks in Philadelphia, have caused that office no little concern and trouble in apprehending and examining the arriving aliens aboard. It necessitated much closer watch on arriving ships and the frequent details of inspectors to make trips to other points on the river outside of Philadelphia to apprehend, examine, and secure medical inspection of arriving aliens.

It might also be of interest to report that through the facilities here afforded, the immigration officials have been enabled to make an exhaustive investigation and examination of all arriving aliens during the past year which has enabled them to detect and remove from ships a number of enemy aliens. Some of these were signed on under assumed names, and some had spurious passports.

Still more interesting is the fact that there was detected aboard a ship arriving at Reedy Island from a southern port, an alien enemy who had escaped from a southern detention camp where he had been interned with a number of other members of the crew of a German raider.

#### MANILA, P. I.

In the Philippines the medical inspection of arriving aliens is made by the officials of the United States Public Health Service on duty in the islands under detail as quarantine officers and the immigrant medical inspection work is performed in addition to the national and consular quarantine transactions. No special, or even other provisions, have been made for conducting the medical work in connection with arriving aliens at any of the Philippine ports. It is still necessary to make the examinations on board arriving vessels or in the quarantine or immigration offices.

The immigration laws of the United States are in force in the Philippine Islands and the methods pursued naturally follow those used in the United States in conducting the same class of work.

The tables submitted give the work in detail. There were 3,124 stool examinations made for hookworm, 17 of which were positive. All were treated and subsequently landed.

The nationalities represented by the said alien arrivals were classed as follows for the last four calendar years:



Peoples.	1914	1915	1916	1917
Chinese.....	2,383	2,823	2,703	3,094
Dutch and Flemish.....	4	10	7	23
East Indian.....	61	60	46	63
English.....	134	101	122	149
French.....	23	6	21	11
German.....	83	17	7	4
Irish.....	7	2	3	0
Italians.....	8	8	6	2
Japanese.....	1,029	744	1,374	3,453
Portuguese.....	7	11	21	20
Russian.....	26	25	20	18
Scandinavian.....	3	5	4	18
Scotch.....	24	16	7	0
Spanish.....	207	204	252	62
Syrian.....	2	6	4	4
Turkish.....	5	1	2	0
Other peoples.....	26	28	32	18
Total.....	4,032	4,067	4,641	6,939

## PORT ARTHUR, TEX.

Acting Asst. Surg. W. S. Winter reports as follows:

During the fiscal year ended June 30, 3,859 aliens were examined at the ports of Sabine, Port Arthur, Sabine Pass, Beaumont, Orange, and Port Neches. Of this number 309 were certified for physical or mental defects.

Since the enactment of the immigration law of February 5, 1917, Japanese laborers have also been excluded regardless of physical defects, under the operation of the provision of the act of February 5 requiring medical examination of alien seamen. It is estimated that there will be a very material increase in the number of aliens examined at Port Arthur and its various subports during the coming year on account of the increased shipping due to the growing importance of Port Arthur, Beaumont, etc., in oil production.

At this particular time there is money being raised in this locality with which to build and install bat roosts in view of exterminating the mosquitoes which no doubt will be very valuable to the community.

## PORT HURON, MICH.

Acting Asst. Surg. George M. Keel reports as follows:

During the year ending June 30, 1918, 1,774 alien passengers were inspected at this port, of whom 469 were certified as affected with mental or physical defect or disease. During the year 126 certified alien passengers were returned to Canada either partly or wholly on account of the medical certification.

The character of the immigrants examined at this port remained as in the preceding year, over 90 per cent being natives of the Dominion of Canada. There was, however, a notable decrease in the number of immigrants inspected during the past year as compared with the year preceding.

In August, 1917, with the cooperation of the inspector in charge, United States Immigration service, at this post, arrangements were made to utilize a small room, in the Immigration Building, for laboratory purposes, and the equipment necessary was supplied by the

United States Public Health Service. This laboratory has greatly facilitated exact diagnosis in conditions where microscopical confirmation was necessary.

The immigration act of February 5, 1917, imposed the duty of medical inspection of alien seamen upon officers of the Public Health Service acting in connection with the Immigration Service. Every effort was made at this port to conduct these physical examinations without causing delay to shipping. In all 10 alien-vessel crews were examined and 31 of the 175 seamen certified.

#### SAN DIEGO, CAL.

Acting Asst. Surg. A. L. Derbeshire reports as follows:

During the fiscal year ending June 30, there were examined by the medical officers of the United States Public Health Service at the port of San Diego, Cal., 464 alien immigrants for the purpose of detecting disease and physical or mental defects in accordance with the provisions of the United States immigration laws. This number of aliens, as compared with 890 for the previous year, shows a decrease of 426. This is accounted for by the entry of the United States into the European War and the consequent restrictions placed upon immigration through passport requirements.

In addition to the above, there were also examined, as provided in the act of February 5, 1917, 3,376 alien seamen, arriving on 422 vessels. There has been a great increase in this class of work as a result of two causes, viz: The new regulations of the Immigration Service and a Mexican custom law which requires all fishing vessels taking fish from Mexican waters adjacent to the port of Ensenada, Mexico, to enter and clear from that port prior to returning to the United States with their cargoes. The crews of most of these vessels are aliens, principally Italians, Portuguese, and Slavonians. Having touched foreign soil and sailing under a foreign flag, they were clearly within the rule governing seamen and required examination as contemplated in the act of February 5, 1917. In consequence the work of this station has increased fourfold.

In addition to the examination of the alien members of the crews as mentioned above, there were special examinations conducted in the office of the inspector in charge, Immigration Service, of 144 bonafide seamen seeking entry in pursuit of their calling, and 14 special examinations of alien seamen seeking admission as immigrants.

There were 85 special examinations of aliens either at the office of the inspector in charge, Immigration Service, the county jail, or other institution where the aliens were detained in prospective warrant cases looking to deportation proceedings. In 42 of these cases warrants of deportation were issued by the Secretary of Labor. In a number of them warrant proceedings were originally based on the "likely to become charge" feature of the immigration act, such charge being frequently augmented by the discovery of mental or physical defects by the United States Public Health Service officer. In at least five cases it may be said that warrants of deportation were based principally upon medical certificate.

*Summary of transactions.*

Vessels boarded .....	422
Total number of alien passengers examined .....	464
Total number of alien seamen examined .....	3, 376
Total number of aliens examined in warrant proceedings .....	85
Grand total .....	4, 347
Number of arriving aliens certified for mental defects .....	1
Number of arriving aliens certified for physical defects .....	5

## SAN FRANCISCO, CAL.

Surg. W. C. Billings, in charge, reports as follows:

The fiscal year 1918 shows, strangely enough, an increase of approximately 33 per cent of alien passengers examined over the number examined in 1917. It also shows a slight increase in the number of passengers sent to hospital for examination, but this increase is not in proportion to the total number examined which may perhaps be an evidence of more diligent examination at the ports of embarkation.

In addition to the alien passengers inspected, 47,039 alien seamen were examined during the year.

Of the number of passengers sent to hospital 632 were certified to the immigration authorities as presenting some defect falling within the medical classification of the immigration law, and of this number 15 were in class A (I) (6 with mental afflictions and 9 with tuberculosis) and 96 in class A (II). The decline in numbers in this class is attributed to the ruling issued during the year, that uncinariasis should be placed in class B. Fifty-five passengers presented evidence of trachoma, and of this number 38 were deported. It seems regrettable that this proportion should still obtain, as every effort is made to show steamship doctors (and others) exactly what constitutes trachoma in the viewpoint of this station, nevertheless the percentage of that disease brought to the United States remains considerable and works a hardship both on the alien and the steamship company.

The recent ruling relative to the placing of clonorchiasis, paragonamiasis, and shistosomiasis in the class A (II) division has resulted in 14 cases of these affections being certified. Of this number 65 per cent were deported.

Equipment for the proper isolation of contagious cases remains exactly the same as last year, and I feel that I must earnestly urge that something be done to promote a safer condition in this respect. We can not continue indefinitely to be blessed with the good fortune which has obtained in the past, and once a well-developed epidemic of virulent disease is inaugurated it will be too late to commence operations to reinforce the two small rooms on the main business corridor of the hospital, which are all we have at present in which to handle cases of this sort.

Hearty cooperation has been extended by the commissioner's office to the medical division during the year.

Transactions in the immigration hospital for the year ended June 30, 1918, are as follows:

Number of immigrants in hospital July 1, 1917	32
Admitted during the year	914
Total in hospital during the year	946
Recovered	792
Improved	89
Unimproved	48
Deaths	3
In hospital June 30, 1918	14

## SEATTLE, WASH.

Acting Asst. Surg. F. R. Underwood reports as follows:

The decrease in the total number of medical examinations was largely due to the abrupt termination of Russian immigration in the latter part of the preceding fiscal year. There will be a renewal of this class of immigration in the near future. Certifications of infection by hookworm have increased in number, the cases being treated in the immigration detention house by local physicians under the same arrangement as formerly obtained.

Medical attention has been given to the prisoners of the Immigration Service who were held in the immigration detention quarters. Sick calls were held each morning as the prisoners were often found to be physically defective. Some of these individuals have been in the station the better part of the year. The quarters are not suitable to long confinement and some of these individuals have been in the station the better part of a year.

An open compound is vitally necessary in connection with the immigration station and by the expenditure of a small sum for the construction of a roof inclosure such a compound would be available. Inasmuch as a permanent immigration building does not seem probable for a number of years, a small outlay in the way of expenditures seems to be justified for the better care and health conditions of the detained alien, even though the building is not owned by the Government and is merely leased for a limited period of time.

## VANCOUVER, BRITISH COLUMBIA.

Acting Asst. Surg. W. D. Keith reports as follows:

During the fiscal year ending June 30, 1918, there were examined at this port 956 immigrants for the purpose of detecting disease and physical and mental defects in accordance with the provisions of the United States immigration laws.

As the number of immigrants have been fewer during the past year, a more thorough examination of each immigrant has been possible. One result of this has been an increase in the number of cases coming under class A-1, the larger number in this class being tubercular and a lesser number exhibiting mental defects. An ever-increasing number of war-damaged soldier immigrants is very noticeable at this port. So far no mentally defective returned soldier immigrant has presented himself for medical examination.

## WINNIPEG, MANITOBA, CANADA.

Acting Asst. Surg. C. Y. Douglass reports as follows:

During the fiscal year ended June 30, 1918, there were 9,560 aliens examined at this station, as compared with 10,984 last year and with 9,532 during the fiscal year 1915.

While travel to the United States through this port has been much less than usual, the number appearing before the medical examiner has not varied greatly. This is accounted for by the fact that many who before the war were examined only by the inspectors on the trains are now electing to come to the office to avoid the risk of being returned from the border.

The number presenting mental and physical defects certifiable under the immigration law has increased from 1,436 last year to 1,782 this year and is 250 per cent higher than two years ago. This increase is due to the growing popularity in this part of Canada of American medicine and surgery, and to the fact that while the "physically fit" have difficulty in obtaining permission from the Canadian authorities to leave the country, little or no restriction is put by them on those not in good health, especially when going to receive the benefit of climate or of medical treatment.

About 75 per cent of those certified claimed to be going to seek the advice of American specialists. Each case was given as thorough an examination as the facilities of the office would permit, in order to determine the nature of the trouble, its classification, and the likelihood of permanent disability resulting; this information was embodied in the certification for the information of the inspector who determined the admissibility of the case.

Of those affected with class A diseases, or who for some other reason were denied admission by the board of special inquiry, 120 availed themselves of the privilege of entering temporarily under bond for the purpose of treatment. The conditions of each bond require them to go directly to some hospital, to remain there until the treatment is finished, and then to return to Canada.

Though a careful search has been made throughout the year for cases of infectious disease, especially trachoma and venereal, only 19 certifications were made under class A-2.

Numbers of soldiers discharged from the Canadian Army as "medically unfit for further service" account for most of the certifications for deformity, nervous disease, and loss of limb. Some of these were going for treatment, others for special vocational training, and still others intended to settle in a more equable climate.

While the larger part of the immigration this year was transient, there were some home seekers among them. These were mostly agricultural and trades people of neutral citizenship. There was often one member of the family whose health was not good and on whose account the migration was being made, and tuberculosis was fairly common.

In addition to the medical examination of immigrants, some 300 physical examinations, at the request of the consul general at this point, were made of persons drafted for the American Army and living in this part of Canada.

There has been no change during the year in the quarters occupied or the routine of the examination, and the work is still handicapped by the lack of laboratory facilities.

## SANITARY REPORTS AND STATISTICS.

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The work of the division of sanitary reports and statistics consists principally of (1) the collection of information of the prevalence and geographic distribution of preventable diseases throughout the United States, including the areas surrounding military cantonments, and of certain major epidemic diseases throughout the world; (2) the collection of laws and regulations adopted by States and cities on matters pertaining to the public health; (3) the publication in the weekly Public Health Reports of current data regarding the prevalence of disease and other information useful to the health officer in his work; (4) the publication of the more important articles appearing in the Public Health Reports in the form of reprints and of articles of educational value and interest to the public generally in the form of supplements; (5) the annual publication of morbidity and mortality statistics, of sanitary legislation, and of directories of health authorities; (6) the issuing of a daily statement of the prevalence of disease, copies of which are furnished the Surgeons General of the Army and the Navy, the medical section of the Council of National Defense, and other governmental agencies interested.

### MORBIDITY REPORTS FROM EXTRA-CANTONMENT ZONES.

With the establishment by the service of zones around the military cantonments throughout the country, there was opened up the possibility of more complete morbidity returns than had previously been received for any miscellaneous group of the population. Experienced service officers are in charge of each zone in cooperation with State and local health authorities and the American Red Cross, and these officers not only realize the importance of a knowledge of when, where, and under what conditions a disease is occurring, but are in a position to enforce reporting to a greater degree than the average health officer. Advantage has been taken of this opportunity to secure the following series of reports from the service officers in charge of the zones:

- (1) Daily morbidity reports, mailed to the bureau.
- (2) Weekly telegraphic reports, for publication in the Public Health Reports.
- (3) Records of termination of cases and similar data. The officers in charge of most of the zones send to the bureau the original case cards which have been received from physicians treating the cases. The data thus obtained will be of great value when they are tabulated and analyzed.

During the first six months of 1918 morbidity data from practically all of the extra-cantonment zones were published weekly in the Public

Health Reports. On pages 282-286 of this report will be found some of these data summarized by months and by zones.

One of the important outcomes of the receipt of morbidity returns from the zones was the possibility of currently transmitting the information obtained to the Army, Navy, and Council of National Defense. Accordingly daily statements were prepared for this purpose. At the present time these statements contain:

(1) Transcripts of the daily reports mailed to the bureau by officers in charge of extra-cantonment zones.

(2) Transcripts of monthly reports from collaborating epidemiologists, acting assistant surgeons serving as collaborating epidemiologists, and State health officers. This information is furnished in the daily statement immediately on its receipt in the bureau and is therefore available to governmental agencies prior to publication in the Public Health Reports.

(3) Transcripts of weekly postal-card reports from the larger cities. This information likewise is available to governmental agencies prior to publication in the Public Health Reports.

(4) Information of unusual or immediate importance relative to the prevalence of disease from current summaries telegraphed weekly by the States or from any other available source.

#### COLLABORATING AND ASSISTANT COLLABORATING EPIDEMIOLOGISTS.

With a view to assisting the States in the collection of accurate morbidity returns, collaborating and assistant collaborating epidemiologists have been appointed by the service in a number of States.

The collaborating epidemiologists are appointed one to a State at nominal salaries. In some States health officers have recently been made acting assistant surgeons of the Public Health Service. As such they perform the duties of collaborating epidemiologists in connection with their other duties.

Collaborating epidemiologists or acting assistant surgeons have been appointed by the service in the following States: Alabama, Arkansas, Connecticut, Georgia, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Montana, New Jersey, North Carolina, Ohio, Oklahoma, South Carolina, Vermont, Virginia, and Washington.

The duties of the collaborating epidemiologists may be summarized as follows: (1) To report by telegraph whenever, within the State for which they are appointed, there is an unusual outbreak or a sudden increase in the number of cases of any of the following diseases: Smallpox, typhoid fever, scarlet fever, poliomyelitis (infantile paralysis), diphtheria, and epidemic cerebrospinal meningitis. (2) To report by telegraph whenever cases of any of the following diseases occur within the State: Cholera, typhus fever, yellow fever, plague, Rocky Mountain spotted (or tick) fever. (3) To make weekly telegraphic reports summarizing information as to the prevalence of notifiable diseases. (4) To make monthly reports by the 20th of each month of the number of cases of the notifiable diseases reported in the State during the preceding month. This last information is usually taken from the records of the State department of health.

In addition to the collaborating epidemiologists, the service is now appointing assistant collaborating epidemiologists at nominal salaries of \$1 per year. These assistants are local health officers, appointed upon the recommendation of the State health officer. The assistant epidemiologist sends out return cards to practicing physicians on which they report the number of cases of notifiable diseases treated by them. The assistant collaborating epidemiologist then sends these cards to the collaborating epidemiologist, who reports to the service as indicated above.

At the end of the fiscal year just closed there were assistant collaborating epidemiologists in Alabama (8), Georgia (4), and North Carolina (93). Plans are being completed for the extension of this system to Kansas and other States.

### STATE MORBIDITY REPORTS.

By the end of the last fiscal year monthly reports of morbidity were being received from 39 States, some of which, however, were not sending reports for every month. The list of States follows:

Alabama.	Maine.	Ohio. <sup>4</sup>
Arizona. <sup>1</sup>	Maryland.	Oregon.
Arkansas. <sup>2</sup>	Massachusetts.	Pennsylvania.
California.	Michigan.	Rhode Island.
Colorado.	Minnesota.	South Carolina.
Connecticut.	Mississippi.	South Dakota.
District of Columbia.	Montana. <sup>3</sup>	Texas. <sup>5</sup>
Idaho.	Nebraska.	Vermont.
Illinois.	Nevada.	Virginia.
Indiana.	New Jersey.	Washington.
Iowa.	New York.	West Virginia.
Kansas.	North Carolina.	Wisconsin.
Louisiana.	North Dakota.	Wyoming.

\* At the end of the previous fiscal year monthly reports of morbidity were being received from 35 States.

The forms used for the monthly reports are provided by the service and are in accordance with resolutions adopted by conferences of the State and Territorial health authorities with the Public Health Service. These forms are used by the collaborating epidemiologists in those States where they have been appointed; in other States they are used by the State health officers.

Separate blanks are provided for the more important diseases in order that information of special importance in regard to each disease may be received by the bureau. The blank for smallpox requests the following information: County, township, or city; number of new cases reported during the month; deaths; vaccination history of cases. Where deaths occur, the State health officer or the collaborating epidemiologist is to make a report of the outbreak at its close on a more comprehensive form.

For leprosy, a case report blank is provided, in order to secure all the information available about the case.

Typhoid fever, epidemic cerebrospinal meningitis, poliomyelitis, Rocky Mountain spotted or tick fever, malaria, and pellagra have

<sup>1</sup> First monthly report, June, 1918.

<sup>2</sup> No monthly report since February, 1918.

<sup>3</sup> First monthly report, May, 1918.

<sup>4</sup> No monthly report since April, 1918.

<sup>5</sup> First monthly report, April, 1918.



report blanks requesting information as to the number of cases in each county, township, or city.

A special blank is provided for occupational diseases and disabilities and covers caisson disease (compressed-air illness), and poisoning from arsenic, brass, carbon monoxide, lead, mercury, natural gas, phosphorus, wood alcohol, naphtha, bisulphate of carbon, and dinitrobenzene. Space is left for other diseases and disabilities contracted as a result of the nature of the person's employment.

One form is used for scarlet fever, measles, diphtheria, dysentery, and other diseases which may be notifiable in the State making the report. The total number of cases reported during the month for the entire State is all the information requested regarding these diseases.

In addition to the monthly reports, the States are asked to make the following reports: (1) Telegraphic reports of the number and location of cases of cholera, typhus fever, yellow fever, plague, Rocky Mountain spotted or tick fever; (2) report by mail on special forms for the diseases just mentioned; (3) telegraphic notification (followed by letter) of an unusual outbreak or a sudden increase in the number of cases of smallpox, typhoid fever, scarlet fever, epidemic poliomyelitis, diphtheria, epidemic cerebrospinal meningitis; (4) weekly reports by telegraph of the general prevalence of disease in the State; (5) annual summaries of the number of cases and deaths occurring from each communicable disease.

The past fiscal year has witnessed the inauguration of the weekly current summaries mentioned under (4). These are received by telegraph and are published immediately in the Public Health Reports. At the end of the fiscal year such reports were being received regularly from Alabama, California, Connecticut, Illinois, Indiana, Kansas, Louisiana, Massachusetts, Minnesota, Nebraska, New Jersey, Ohio, South Carolina, Vermont, Virginia, and Washington, and occasionally from Arkansas, Georgia, and Mississippi.

For the calendar year 1917 annual summaries of cases, mentioned under (5), were received from 39 States, an increase of 11 over the preceding year. The population of these States (estimate of July 1, 1917) is 87,640,879. The population of the States from which these annual summaries were received for 1916 was 67,348,100. Annual summaries of registered deaths are also received from the States. Since 1912 the service has published annual statements of the prevalence of certain communicable diseases in the States furnishing these data.

#### CITY MORBIDITY REPORTS.

Weekly municipal morbidity reports are received from those cities which have efficiently organized health departments. These reports are made on franked postal-card forms, which are supplied to the health officers of all cities having 25,000 population and over and also to many of the smaller urban communities. Reports are asked for erysipelas, gonorrhea, leprosy, malaria, meningitis (epidemic cerebrospinal), pellagra, pneumonia (lobar), poliomyelitis, rabies (in man), rabies (in animals), smallpox, syphilis, tetanus, typhoid fever, typhus fever, diphtheria, measles, scarlet fever, and tuberculosis (all forms). At the end of the fiscal year about 450 cities

were reporting with satisfactory regularity and another 100 were reporting occasionally. In June, 1916, 160 cities were making these reports, and in June, 1917, a little over 200.

A great increase in the number of cities sending in annual summaries of diseases and of registered deaths also occurred during the fiscal year 1918. For the calendar years 1912-1917, the service has compiled and published annual statements of the prevalence of certain notifiable diseases in cities of the United States having a population of 10,000 or more.

#### PUBLICATION OF SANITARY DATA.

Pursuant to the acts of Congress approved February 15, 1893, and August 14, 1912, the Public Health Reports have continued to be issued weekly during the year. They have given each week current information of the prevalence of communicable diseases and the occurrence of epidemics. The information which they have contained is important in adding to the efficiency of health administration throughout the country. It has been information which was not being furnished by other sources, and which could not be so furnished advantageously or properly. An earnest effort has been made to send the reports to all health officers who wanted them and would put them to proper use.

The sanitary information published in the Public Health Reports is divided into the following departments:

1. Prevalence of disease (giving the prevalence and geographic distribution of the preventable diseases in the United States).
2. Foreign reports (giving information of the prevalence of disease and important sanitary measures in foreign countries).
3. Special articles of interest to health officers (more important ones being reprinted in pamphlet form).

Owing to the necessity for economy in printing in connection with the war, every effort has been made to avoid the publication of material not of current and great importance. The number of printed pages of the Public Health Reports was reduced from 3,563 in the calendar year 1916 to 2,251 in 1917. The number of reprints has been greatly reduced and the publication of current sanitary legislation has been temporarily discontinued. This legislation, a knowledge of which is of great importance in strengthening health departments and promoting efficient health administration, will, however, be published annually as in the past. These laws and regulations are compiled for the information of legislators, officers of the Public Health Service, State, county, and city health officers, and others who are called upon to draft laws, ordinances, or regulations designed to protect the public against preventable diseases. The compilations show the trend of legislation and make it possible to select laws and regulations which have proved workable and effective in actual practice. It should be mentioned here that requests for assistance in drafting public health measures are complied with by the division whenever possible.

Comprehensive directories of State and city health officials were prepared during the year and were in course of publication on June 30. The directory for State health officials includes the entire per-

sonnel of the departments, as reported by the health officer, and also gives information as to appropriations and publications. The directory for city health officers was based on a questionnaire sent out to such officers. In the cases of those cities which did not reply to the questionnaire the names of health officers have been included in the directory whenever it was possible to obtain their names from other sources. Both directories are more complete than similar directories issued in the past by the service.

### PREVALENCE OF DISEASE IN UNITED STATES.

On the following pages reports received by the service in regard to each important communicable disease are discussed and summarized in tables giving the data by States<sup>1</sup> for 1917 and the averages for those preceding years for which data have been obtained.

As these averages permit a comparison between the reported prevalence of these diseases for 1917 and for the previous years, it has been thought of value to give the totals for all of the States reporting and the corresponding case and fatality rates. These will be found in the discussion under each disease. To obtain case rates for the previous years, it was found convenient to take the estimated population of a certain date (July 1, 1915) as indicative of the average population in the States for which the average number of reported cases per year were determined. From this average population and average number of cases, a case rate was secured which is believed to be representative of reported disease prevalence in these States for the last three or four years. This rate was therefore compared with the 1917 case rate in the same States. In a similar way a fatality rate for 1917 and an average fatality rate for the previous years was worked out for those States which reported both cases and deaths in 1917 and in at least one previous year. Such fatality rates, although seldom showing the true fatality of a disease, are of importance in estimating the accuracy of reporting.

In considering the following tables and the discussion of them it should be constantly kept in mind that a relatively large number of reported cases of a communicable disease, as indicated by a high case rate (and more especially when accompanied by a relatively small number of deaths, as indicated by a low fatality rate), usually means that the health department of that State is active and that the cases of the disease are being properly reported by the practicing physicians. It does not necessarily mean that the disease is more prevalent in that State than in other States. A high fatality rate may mean that the disease was unusually virulent in a State, that the physicians did not treat the disease in that State with the success usual elsewhere, or that the physicians did not report all of their cases. On the other hand, an unusually low fatality rate may be due to the fact that the disease in the State was unusually mild, that the physicians treated it with unusual success, that the physicians reported their cases satisfactorily, or that the registration of deaths was incomplete or the assignment of the causes of death inaccurate.

<sup>1</sup> Throughout the discussion the word "States" is to be understood as including the Territories and the District of Columbia.

## ANTHRAX.

For the calendar year 1917, 202 cases of anthrax in man were reported to the service by State health authorities. This is an increase over the number reported in 1916 of 96, or 90 per cent. There was an increase of 67 per cent in the number of States reporting the disease. Sixty-two deaths were reported in 1917, giving a case fatality rate of 30.69 per cent.

Reports of 1917 cases were received from the following States: California, 23; Colorado, 4; Connecticut, 1; Illinois, 2; Kansas, 2; Louisiana, 27; Maryland, 1; Massachusetts, 54; New Jersey, 21; New York, 32; Ohio, 3; Pennsylvania, 25; Texas, 3; Vermont, 2; and Wisconsin, 2.<sup>1</sup> Anthrax is reportable in 28 States.

As a matter of interest the monthly distribution of the cases reported for both 1916 and 1917 are given in the following table:

Month.	1916	1917	Total.	Month.	1916	1917	Total.
January.....	4	12	16	July.....	4	20	24
February.....	8	9	17	August.....	7	21	28
March.....	16	11	27	September.....	11	13	24
April.....	6	14	20	October.....	12	26	38
May.....	13	22	35	November.....	8	21	29
June.....	11	24	35	December.....	6	9	15

Data which have been received concerning the source of infection in case of anthrax indicate that the infection is frequently received from handling or skinning infected animals and from handling hides.

## DENGUE.

From four States reports of 34 cases of and 13 deaths from dengue were received for the calendar year 1917, as follows: Texas, 24 cases, 9 deaths; Hawaii, 5 cases, 4 deaths; Louisiana, 4 cases, no deaths; Colorado, 1 case, no death. In Louisiana 122 cases were reported as occurring in May, 1918. An investigation by a service officer of the cases reported from Louisiana indicated that while some of them might have been dengue most were due to a fever of unknown origin.

## DIPHTHERIA.

In the 39 States for which reports of diphtheria were received for 1917, 114,832 cases were reported as occurring, giving a case rate per 1,000 population of 1.310. The average indicated fatality rate for 36 States was 10.40 per cent.

In the 36 States for which reports of cases were received for both 1917 and at least one previous year, 113,078 cases were reported as occurring in 1917 and an average of 105.741 for the previous years, giving respective case rates of 1.351 and 1.306.

In the 24 States for which records were received of both cases and deaths for both 1917 and at least one previous year 68,355 cases and 7,141 deaths were recorded for 1917 and an average of 64,920 cases and 6,524 deaths for the previous years, the fatality rates being, respectively, 10.45 and 10.05.

The highest case rates for 1917 are recorded as 3.060 (District of Columbia), 2.734 (Massachusetts), 2.359 (Michigan), and 2.202 (Illinois).

<sup>1</sup> Not reportable in Wisconsin.

nois). The highest average rates for the previous years for which data are available are: 2.156 (New Jersey), 2.036 (New York), 1.915 (Illinois), 1.882 (Connecticut), and 1.808 (Massachusetts).

The fatality rates for 1917 varied from 37.15 (Arkansas) to 3.27 (District of Columbia). The average fatality rates for the previous years varied from 29.01 (Alabama) to 5.07 (District of Columbia).

State.	1917					Annual averages.		
	Estimated population July 1, 1917.	Cases reported.	Deaths registered.	Case rate per 1,000.	Fatality.	For the years—	Cases reported.	Case rate per 1,000.
					<i>Per ct.</i>			
Alabama.....	2,363,939	737	191	0.312	25.92	1913, 1915, 1916.....	617	0.270
Arkansas.....	1,766,343	288	107	.163	37.15	1913-1916.....	2,772	.989
California.....	3,029,032	2,564	198	.846	7.72	1914, 1916.....	556	.594
Colorado.....	988,320	586	45	.593	7.68	1912-1916.....	2,263	1.882
Connecticut.....	1,265,373	2,367	224	1.871	9.46	1912-1916.....	533	1.508
District of Columbia.....	369,282	1,130	37	3.060	25.92	1912-1916.....	180	.865
Hawaii.....	219,580	121	18	.551	14.88	1912-1916.....	11,305	1.915
Illinois.....	6,234,995	13,732	1,725	2.202	12.56	1912-1916.....	3,623	1.303
Indiana.....	2,835,492	4,097	444	1.445	10.84	1912-1916.....	855	.335
Iowa.....	2,224,771	637	.....	.286	.....	1912-1916.....	1,436	.805
Kansas.....	1,851,870	1,353	155	.731	11.46	1914-1916.....	998	.554
Louisiana.....	1,856,954	1,222	102	.658	8.35	1916.....	407	.527
Maine.....	777,340	302	65	.389	21.52	1915, 1916.....	6,433	1.808
Maryland.....	1,373,673	1,596	134	1.162	8.39	1912, 1913, 1916.....	5,025	1.677
Massachusetts.....	3,775,973	10,322	836	2.734	8.10	1912-1916.....	2,791	1.261
Michigan.....	3,094,266	7,300	783	2.359	10.73	1912-1916.....	1,092	.567
Minnesota.....	2,312,445	3,890	254	1.682	6.53	1912-1916.....	191	.445
Mississippi.....	1,976,570	951	157	.481	16.51	1913, 1915.....	6	.061
Montana.....	472,935	287	39	.607	13.58	1912-1916.....	6,070	2.156
Nevada.....	110,738	19	5	.172	26.32	1912-1916.....	20,152	2.036
New Jersey.....	3,014,194	5,326	447	1.767	8.39	1912-1916.....	8,756	1.721
New York.....	10,460,182	19,183	1,745	1.834	9.10	1912, 1913, 1915.....	1,308	.665
North Dakota.....	765,319	539	48	.704	8.91	1912-1916.....	291	.372
Ohio.....	5,212,985	7,935	749	1.522	9.44	1912-1916.....	13,277	1.610
Oklahoma.....	2,289,855	731	108	.319	14.78	1914, 1915.....	158	.133
Oregon.....	861,992	171	17	.198	9.94	1914, 1916.....	1,031	1.710
Pennsylvania.....	8,660,042	16,404	2,016	1.894	12.29	1913, 1916.....	1,800	1.126
Porto Rico.....	1,231,880	112	40	.091	35.71	1913, 1914.....	268	.411
Rhode Island.....	625,863	1,186	.....	1.895	.....	1915.....	2,433	.560
South Carolina.....	1,643,205	1,534	70	.934	4.56	1912-1915.....	342	.835
South Dakota.....	716,972	226	16	.315	7.08	1914-1916.....	482	1.330
Texas.....	4,515,423	1,309	238	.290	18.18	1912-1916.....	3,354	1.560
Utah.....	443,866	305	43	.687	14.10	1913-1916.....	462	.321
Vermont.....	364,946	344	27	.943	7.85	1913-1916.....	2,183	.887
Virginia.....	2,213,025	2,048	.....	.925	.....	1913-1916.....	29	.169
Washington.....	1,597,400	414	47	.259	11.35	1913-1916.....	.....	.....
West Virginia.....	1,412,602	927	73	.656	7.87	1913-1916.....	.....	.....
Wisconsin.....	2,527,167	2,520	326	.997	12.94	1913-1916.....	.....	.....
Wyoming.....	184,970	117	14	.633	11.97	1913-1916.....	.....	.....

## DYSENTERY.

The following outbreaks of dysentery have been reported to the service since the preparation of the last annual report:

Location.	Date reported.	Number of cases reported.	Number of deaths reported.
War Creek, Breathitt County, Ky. <sup>1</sup> .....	Aug. 25, 1917	.....	16
Grafton State Hospital, Massachusetts.....	Aug. 24, 1917	75	.....
Quicksand, Ky.....	Sept. 19, 1917	86	.....
Sand Coulee, Mont.....	Sept. 12, 1917	70	.....
Stockett, Mont.....	do.....	10 or 12	.....
Narrows, Giles County, Va.....	Sept. —, 1917	.....	.....
State insane asylum, Medfield, Mass.....	Oct. 2, 1917	57	.....

<sup>1</sup> Account of an investigation of this outbreak by an officer of the service will be found in the Public Health Reports for Sept. 14, 1917.

<sup>2</sup> These cases were reported as having occurred during a period of two months.

## INFLUENZA.

The occurrence of 18 cases of influenza of severe type, from which 3 deaths resulted, was reported at Haskell, Kans., March 30, 1918.

Since the ending of the fiscal year an epidemic of influenza of an extraordinarily fatal type has spread throughout the United States. Up to and including November 9 approximately 129,000 deaths from influenza and pneumonia (all forms) had been reported to the Service.

## LEPROSY.

Special schedules were sent to the health departments of States and to cities having a population of over 10,000 asking for information regarding the known occurrence of leprosy in their respective jurisdictions during the calendar year 1917. The following tables give the information of the prevalence of the disease collected in this way. It is probable that there were a few known cases in cities from which no reports were received. Undoubtedly there were also a number of cases which were not reported because their existence was unknown to the health departments.

*Reports of leprosy, by States, for 1917.*

State.	Present Jan. 1, 1917.	Reported during 1917.	Died or removed 1917.	Present Dec. 31, 1917.	Isolated under State control.	Isolated under local control.
California.....	27	20	16	31		31
Fresno County.....				1		
Los Angeles County.....				4		
Monterey County.....				1		
Oakland.....				5		
San Francisco County.....				19		
Santa Clara County.....				1		
Colorado:						
Pueblo.....	1			1		1
Connecticut:						
Ansonia.....	1			1		1
District of Columbia.....	1			1	1	
Hawaii.....	651	79	92	638	638	
Molokai—						
Kalaupapa.....				593	593	
Oahu—						
Honolulu (Kalihi hospital).....				45	45	
Illinois:						
East Moline (Watertown State Hos- pital).....	1					
Indiana:						
Fort Branch.....	1			1	1	
Louisiana:						
Carville (State leper home).....	91	9	9	91	91	
Massachusetts:						
Dukes County, Penikese Island (leper colony).....	9	3	1	11	11	
Minnesota.....	7			7		7
Cokato, Wright County.....				1		
Montevideo, Chippewa County.....				1		
Linden Twp., Brown County.....				1		
Albert Lea, Freeborn County.....				1		
Elbow Lake, Grant County.....				1		
Moscow Twp., Freeborn County.....				1		
Minneapolis, Hennepin County.....				1		
Mississippi.....		3		3		3
Harrison County.....				2		
Washington County.....				1		

*Reports of leprosy, by States, for 1917—Continued.*

State.	Present Jan. 1, 1917.	Reported during 1917.	Died or removed 1917.	Present Dec. 31, 1917.	Isolated under State control.	Isolated under local control.
Montana:						
Alberton, Mineral County.....		1		1		1
New Jersey:						
Jersey City.....		1	1			
Newark.....	1		1			
Passaic.....	1			1		1
New York <sup>1</sup> .....	20	4	8	16		12
North Dakota:						
Nelson County.....	1			1	1	
Philippine Islands.....	4,919	778	495	5,146	4,629	114
Cullon Leper Colony.....				4,485		
San Lazaro Hospital.....				144		
In various provinces.....				122		
Estimated in various provinces.....				395		
Porto Rico.....	36	6	4	38	38	
Patillas.....		2				
Guayama.....		2				
Ponce.....		1				
San Juan.....		1				
Rhode Island:						
Westerly (town).....		1		1	1	
Texas.....	( <sup>2</sup> )	4	2	( <sup>2</sup> )		( <sup>2</sup> )
Harris County.....		1				
Bexar County.....		2				
Galveston County.....		1				
Utah.....	1		1			
Washington:						
Diamonhead, Jefferson County.....	1			1	1	

<sup>1</sup> Leprosy is not reportable in New York State outside of New York City.<sup>2</sup> Not known.*Reports of leprosy, by cities, for 1917.*

City.	Present, 1917.	Reported during 1917.	Died or removed, 1917.	Present Dec. 31, 1917.	Isolated under local control.
Baltimore, Md.....	1			1	1
Bay City, Mich.....	1			1	
Bellingham, Wash.....		1	1		
Boston, Mass.....		1	1		
Dayton, Ohio.....	1			1	1
Galveston, Tex.....	1	1		1	
Houston, Tex.....		2	2		
Los Angeles, Cal.....	4	7	7	4	4
Milwaukee, Wis.....		1		1	1
New Haven, Conn.....	1			1	1
New York, N. Y.....	20	4	8	16	12
Oakland, Cal.....		2	2		
Passaic, N. J.....	1			1	1
Philadelphia, Pa.....	1	1	1	1	1
Providence, R. I.....		1	1		
Pueblo, Colo.....	1	1	1	1	
Richmond, Va.....	1			1	1
St. Louis, Mo.....	2			2	
San Antonio, Tex.....	1	3	1	3	2
San Francisco, Cal.....	19	9	9	19	19
Springfield, Mass.....		1	1		
Syracuse, N. Y.....		2		1	1
Wilkes-Barre, Pa.....	1		1		
Williamsport, Pa.....	1			1	1

## MALARIA.

The Public Health Service has for the last five years circularized the physicians of most of the Southern States to ascertain as definitely as this means would allow the prevalence of malaria. In the last annual report the information obtained both in this way and from circularizing health departments of other States and of cities of over 10,000 population was summarized to show the geographic distribution of malaria. A map giving the endemic areas of malaria was included.

A certain amount of supplemental data are now available, as in the past fiscal year card forms were sent during certain months to physicians in Georgia, Maryland, New Jersey, Ohio, Oklahoma, Texas, and Virginia to collect data in regard to the prevalence of malaria and the types of infection. The results are given in the following table:

	Cards mailed.	Cards returned, unclaimed, out of practice, etc.	Replies received.	Percentage of replies received.	Counties represented in replies.	Counties not heard from.	Towns or cities represented in replies.	Cases of malaria reported.				Types of infection.			Cases confirmed microscopically.	Cases reported confirmed, types not stated.	Cases of hemoglobinuric fever.
								White.	Colored.	Color not stated.	Total.	Tertian.	Quartan.	Estivo-autumnal.			
Maryland:																	
Jan.....	2,232	12	389	17.52	24	...	200	19	8	...	27	18	...	1	...	3	...
Feb.....	2,232	54	321	14.73	23	1	169	3	3	...	6	2	4	...	1	...	...
Oklahoma:																	
Jan.....	2,634	18	301	11.50	73	4	188	...	...	...	278	195	23	33	38	3	10
Feb.....	2,634	13	195	7.43	67	10	140	...	...	...	217	92	39	41	12	1	34
Mar.....	2,634	20	234	8.95	71	6	167	...	...	...	284	159	36	36	24	1	14
Texas (eastern half):																	
Jan.....	3,450	109	620	18.55	104	9	277	...	...	...	572	239	111	82	56	9	21
Feb.....	3,450	65	515	15.21	96	16	256	...	...	...	419	177	29	38	38	3	16
Mar.....	3,450	51	478	14.07	94	19	250	...	...	...	426	175	24	66	33	7	49
Georgia:																	
Jan.....	3,421	60	164	4.88	103	47	242	...	...	...	120	53	12	18	7	2	4
May.....	3,421	110	584	17.64	138	14	289	864	593	2	1,459	647	126	166	71	9	38
Ohio:																	
Jan.....	7,912	100	1,262	16.15	51	37	316	...	...	...	11	7	...	2	...	1	...
Feb.....	7,912	82	1,113	14.21	44	44	307	...	...	...	11	8	3	...	3	...	...
Mar.....	7,912	87	1,167	14.91	43	45	302	...	...	...	25	10	...	8	4	...	...
Apr.....	7,912	22	538	6.81	38	50	104	5	1	...	6	4	...	1	1	...	...
May.....	7,912	17	384	4.86	43	45	168	9	...	2	11	9	...	5	...	...	...
Virginia:																	
Jan.....	2,420	27	810	33.84	100	...	440	...	...	...	219	103	22	41	18	6	11
Feb.....	2,420	18	759	31.59	98	2	422	...	...	...	154	65	20	19	10	4	7
Mar.....	2,420	16	798	33.19	99	1	441	...	...	...	323	198	27	18	15	1	20
Apr.....	2,420	11	705	29.26	96	4	400	240	144	5	389	235	32	22	17	2	9
May.....	2,420	11	688	28.55	97	3	397	296	154	...	450	238	19	41	30	2	14
New Jersey:																	
Jan.....	3,012	83	950	32.43	21	...	218	...	...	...	79	57	5	6	11	...	4
Mar.....	3,012	72	1,011	34.38	21	...	225	52	...	...	52	23	3	9	6	2	9
Apr.....	3,012	74	910	31.99	21	...	225	75	5	...	80	63	4	7	10	2	4
May.....	3,012	59	841	28.47	21	...	198	82	2	3	87	64	...	5	22	...	1

Reports of 163,206 cases of and 4,885 deaths from malaria were received from the States during the calendar year 1917. The distribution of these reported cases and deaths was as follows: Ala-



bama, 2,476 cases, 530 deaths; Arkansas, 4,592 cases, 616 deaths; California, 736 cases, 46 deaths; Colorado, 4 cases, 2 deaths; Illinois, 2,389 cases, 108 deaths; Kansas, 38 cases, 26 deaths; Louisiana, 1,974 cases, 425 deaths; Maryland, 64 cases, 6 deaths; Massachusetts, 78 cases, 5 deaths; Minnesota, 1 case, 1 death; Mississippi, 140,687 cases, 999 deaths; New Jersey, 156 cases, 5 deaths; Ohio, 17 cases, 14 deaths; Pennsylvania, 11 cases, 15 deaths; Porto Rico, 1,752 cases, 1,805 deaths; South Carolina, 927 cases, 282 deaths; Virginia, 7,303 cases, deaths not recorded; Wisconsin, 1 case, no deaths. The highest reported case rate was in Mississippi (71.177 per 1,000 population), and the next highest in Virginia (3.300 per 1,000). The lowest fatality rates were in Mississippi (0.71 per cent), New Jersey (3.21 per cent), and Illinois (4.52 per cent).

#### MEASLES.

In 37 States 529,498 cases of measles were reported as occurring during 1917, giving a case rate for these States of 6.426 per 1,000 population. The average indicated fatality rate in 35 States was 1.86 per cent.

More cases were reported during 1917 than in previous years. In 32 States for which it was possible to compile data as to reported cases for 1917, and for at least one previous year, it was found that 504,849 cases were reported for 1917 (a case rate of 6.943 per 1,000 population), whereas an average of 323,422 cases (a rate of 4.599) were reported in the same States for the previous years.

In the 19 States for which data were available as to both cases and deaths for both 1917 and at least one previous year, 298,175 cases and 4,199 deaths were recorded for 1917, giving a fatality rate of 1.41 per cent, and an average of 154,730 cases and 2,328 deaths were recorded for the previous years, giving a fatality rate of 1.50 per cent.

The highest reported case rate for measles in 1917 was in Utah, where 15,035 cases were reported, giving a rate of 33.873 per 1,000 population. The rate in Vermont was 28.569 and in Mississippi 25.004. The average rate for all of the States reporting, as mentioned above, was 6.426. The States showing the greatest increase in the number of reported cases per 1,000 population over the average for preceding years were the following: Alabama, from 0.335 to 8.119; Louisiana, from 0.912 to 5.673; Mississippi, from 3.911 to 25.004; Nevada, from 2.289 to 13.229; Oklahoma, from 0.726 to 4.919; and Vermont, from 3.074 to 28.569. The States showing the greatest reduction in the number of reported cases per 1,000 population were the following: Hawaii, from 3.187 to 0.469; Pennsylvania, from 8.134 to 3.628; and Rhode Island, from 2.445 to 1.150. In the case of Hawaii it is interesting to note that the fatality rate, based on reported cases and registered deaths, was reduced from 5.13 to 2.91.

State.	1917					Annual averages.		
	Estimated population July 1, 1917.	Cases reported.	Deaths registered.	Case rate per 1,000.	Fatality.	For the years—	Cases reported.	Case rate per 1,000.
					<i>Per ct.</i>			
Alabama.....	2,363,939	19,193	466	8.119	2.43	1915, 1916.....	776	0.335
Arkansas.....	1,766,343	7,845	216	4.442	2.75			
California.....	3,029,032	21,953	188	7.248	.86	1913-1916.....	7,007	2.500
Colorado.....	988,320	10,374	69	10.497	.67	1914, 1916.....	4,291	4.585
Connecticut.....	1,265,373	7,462	126	5.897	1.69	1912-1916.....	6,333	5.266
District of Columbia.....	309,282	3,807	14	10.309	.37	1912-1916.....	2,576	7.290
Hawaii.....	219,580	103	3	.469	2.91	1912-1916.....	663	3.187
Illinois.....	6,234,995	49,512	766	7.941	1.55	1912-1914.....	19,159	3.245
Indiana.....	2,835,492	30,083	550	10.609	1.83	1914-1916.....	14,254	5.094
Iowa.....	2,224,771							
Kansas.....	1,851,870	22,464	233	12.130	1.04	1912-1916.....	6,998	3.921
Louisiana.....	1,856,954	10,534	250	5.673	2.37	1914-1916.....	1,613	.912
Maine.....	777,340	3,035	130	3.904	4.28	1916.....	1,129	1.462
Maryland.....	1,373,673	10,613	117	7.726	1.10	1915-1916.....	8,782	6.470
Massachusetts.....	3,775,973	23,880	366	6.324	1.53	1912-1913, 1916.....	25,336	7.064
Michigan.....	3,091,266	12,453	241	4.025	1.94	1913-1916.....	8,232	2.748
Minnesota.....	2,312,445	8,333	121	3.591	1.46	1912-1916.....	4,302	1.943
Mississippi.....	1,976,570	49,422	346	25.004	1.11	1914-1916.....	7,536	3.911
Montana.....	472,935	3,885	40	8.215	1.03	1912-1914, 1916.....	2,124	4.948
Nevada.....	110,738	1,465	1	13.229	.07	1913, 1915.....	226	2.289
New Jersey.....	3,014,194							
New York.....	10,469,182	60,860	892	5.818	1.47	1912-1916.....	61,584	6.221
North Dakota.....	765,319	1,135	22	1.483	1.94			
Ohio.....	5,212,085	27,971	564	5.367	2.02	1914-1916.....	29,848	5.866
Oklahoma.....	2,289,855	11,264	168	4.919	1.49	1912, 1913, 1915.....	1,429	.726
Oregon.....	861,992	4,628	55	5.339	1.19	1912-1916.....	1,397	1.784
Pennsylvania.....	8,660,042	31,417	513	3.628	1.63	1912, 1916.....	67,069	8.134
Porto Rico.....	1,231,880	7,001	1,372	5.683	19.60			
Rhode Island.....	625,865	720		1.150		1914, 1916.....	1,474	2.445
South Carolina.....	1,643,205	5,646	183	3.436	3.24	1913-1916.....	2,079	1.300
South Dakota.....	716,972	1,028	3	1.434	.29	1913, 1914.....	1,477	2.264
Texas.....	4,515,423	4,746	672	1.051	14.16			
Utah.....	443,866	15,035	104	33.873	.69	1912-1915.....	4,032	9.843
Vermont.....	364,946	10,426	79	28.569	.76	1914-1916.....	1,114	3.074
Virginia.....	2,213,025	23,294		10.526		1915, 1916.....	14,977	6.865
Washington.....	1,597,400	17,244	203	10.795	1.18	1913-1916.....	6,984	4.852
West Virginia.....	1,412,602	3,922	50	2.776	1.27			
Wisconsin.....	2,527,167	5,711	61	2.260	1.07	1913-1916.....	8,183	3.328
Wyoming.....	184,970	1,064	7	5.752	.70	1913-1916.....	408	2.380

## CEREBROSPINAL MENINGITIS.

In the 33 States for which morbidity reports of meningitis were received for 1917, 4,860 cases were recorded, giving a case rate of 0.063 per 1,000. The average indicated fatality for 28 States was 71.90 per cent. A much greater number of cases were reported than in previous years. Thus, from the 29 States for which reports of cases were received for 1917 and for at least one previous year, reports of 4,797 cases (rate 0.067 per 1,000 population) were received in 1917, as against an average of 1,971 reported cases (rate 0.028) in the previous years for which the information was obtained.

Some of the increase in reported cases is due to better reporting. For instance, for the 17 States registering deaths for both 1917 and at least one previous year, the 1917 death rate was 0.037 per 1,000 population, and the average for the previous years was 0.029, a difference not so great as that found when the morbidity rates for 1917 and for the previous years are compared.

In the 17 States for which reports of both cases and deaths are available for both 1917 and at least one previous year, there were reported 2,245 cases and 1,552 registered deaths in 1917, giving a fatality rate for these States of 69.13. The averages for the previous years were 1.001 cases reported and 1.134 deaths registered.

In this connection it is interesting to compare the fatality rates, year by year, during five years for the five States<sup>1</sup> for which the data were received. These rates are as follows:

	Per cent.		Per cent.
1913.....	86.75	1916.....	69.24
1914.....	75.87	1917.....	53.06
1915.....	78.97		

The highest rate for 1917 was in Connecticut (0.247 per 1,000 population). Meningitis was reported as especially prevalent in Connecticut, Minnesota, Ohio, and Maryland, and more prevalent than usual in these States and in the District of Columbia, Illinois, Kansas, Oregon, Rhode Island, and South Carolina.

The seasonal prevalence of meningitis, as indicated by reported cases, is given for 1917 in the following table:

January.....	190	July.....	326
February.....	294	August.....	214
March.....	632	September.....	198
April.....	831	October.....	202
May.....	739	November.....	236
June.....	532	December.....	466

It will be noted that the peak occurs in April.

The following table gives the data for meningitis as reported to the Public Health Service:

*Cerebrospinal meningitis.*

State.	1917					Annual averages.		
	Estimated population, July 1, 1917.	Cases reported.	Deaths registered.	Case rate per 1,000.	Fatality.	For the years—	Cases reported.	Case rate per 1,000.
					Per ct.			
Alabama.....	2,363,939	63	19	0.027	30.16	1913, 1915, 1916.....	84	0.037
Arkansas.....	1,766,343	12	43					
California.....	3,029,032	133	28	.044	21.05	1913-1916.....	62	.022
Colorado.....	988,320							
Connecticut.....	1,265,373	312	160	.247	51.28	1913-1916.....	42	.035
District of Columbia..	369,282	33	17	.089	51.52	1913-1916.....	6	.017
Hawaii.....	219,580	11	7	.050	63.64	1913-1916.....	8	.038
Illinois.....	6,234,995	450	322	.072	71.56	1913-1914.....	186	.031
Indiana.....	2,835,492	90	62	.032	68.89	1914-1916.....	58	
Iowa.....	2,224,771	45		.020		1913, 1914, 1916.....	28	
Kansas.....	1,851,870	152		.082		1913-1916.....	39	.022
Louisiana.....	1,856,954	42		.023		1914-1916.....	34	.019
Maine.....	777,340	6	22					
Maryland.....	1,373,673	158	22	.115	13.92	1915, 1916.....	50	.037
Massachusetts.....	3,775,973	196	158	.052	80.61	1913, 1916.....	164	.045
Michigan.....	3,094,266							
Minnesota.....	2,312,445	359	186	.155	51.81	1913-1916.....	30	.013
Mississippi.....	1,976,570	40	5	.020	12.50	1914-1916.....	53	.028
Montana.....	472,935	9	29			1913, 1914, 1916.....	13	
Nevada.....	110,738	3	2	.027	66.67	1913, 1915.....	10	.101
New Jersey.....	3,014,194							
New York.....	10,460,182	484	310	.046	64.05	1913-1916.....	348	.035
North Dakota.....	765,319							
Ohio.....	5,212,085	630	313	.121	49.68	1914-1916.....	180	.035
Oklahoma.....	2,289,855							
Oregon.....	861,992	11	2	.013	18.18	1914, 1916.....	4	.005
Pennsylvania.....	8,660,042	901	916			1916.....	162	.019
Porto Rico.....	1,231,880	5	2	.004	40.00			
Rhode Island.....	625,863	64		.102		1916.....	21	.034
South Carolina.....	1,643,205	144	86	.088	59.72	1913-1916.....	19	.012
South Dakota.....	716,972	21	11	.029	52.38	1913, 1914.....	8	
Texas.....	4,515,423	96	109			1915.....	30	
Utah.....	443,866							
Vermont.....	364,946	6	2	.016	33.33	1916.....	7	.019
Virginia.....	2,213,025	169		.076		1915, 1916.....	212	.097
Washington.....	1,597,400	32	31	.020	96.88	1913-1916.....	14	
West Virginia.....	1,412,602	40	29	.028	72.50			
Wisconsin.....	2,527,167	138	248			1913-1916.....	92	
Wyoming.....	184,970	5	14			1913, 1914, 1916.....	7	

<sup>1</sup> California, Connecticut, District of Columbia, Minnesota, and New York.

## POLIOMYELITIS (INFANTILE PARALYSIS).

In the 36 States for which 1917 reports were received, 4,114 cases of poliomyelitis were reported, giving a case rate of 0.049 per 1,000 population. The indicated fatality rate for 33 States was 28.95 per cent. The case fatality of the poliomyelitis epidemic in New York City in 1916, as reported by service officers who investigated the epidemic, was 24 per cent.<sup>1</sup>

The accompanying table makes a comparison between the cases and deaths reported for 1917 and the averages for previous years, including 1916. In view of the immensity of the epidemic in 1916, it appears necessary in summarizing this data to exclude 1916 altogether. This has been done in the case of the figures used in the following discussion.

In 29 States for which cases were reported in 1917 and in at least one previous year (excluding 1916), 3,709 cases were reported for 1917 and an average of 2,589 for the previous years, giving case rates respectively of 0.048 and 0.035 per 1,000 population.<sup>2</sup>

In the 16 States for which cases were reported and deaths were registered for both 1917 and at least one previous year (excluding 1916), 1,860 cases and 535 deaths were recorded for 1917 and an average of 1,340 cases and 343 deaths for the previous years, giving fatality rates respectively of 28.76 and 25.60. As the occurrence of a large epidemic would not invalidate statistics as to fatality rates, such a rate has been worked out from the average number of cases and deaths for the previous years, including 1916. An average of 4,429 cases and 1,071 deaths were recorded, giving a fatality rate of 24.18, approximately that of the New York City epidemic as reported and slightly lower than that obtained by excluding the 1916 figures.

In view of the belief that epidemics of poliomyelitis do not recur in the same locality within two years or more,<sup>3</sup> it may be of interest to contrast the case rates in 1916 and 1917 in those States which had the highest reported case rates in 1916.

State.	Case rates per 1,000 population.	
	1916	1917
New Jersey.....	1.376	0.030
New York.....	1.287	.028
Connecticut.....	.764	.023
Massachusetts.....	.518	.046
Average (36 States).....		.049

<sup>1</sup> During the epidemic in New York City 9,345 cases and 2,243 deaths are reported as occurring. Cf. Public Health Bulletin No. 91, "Epidemiologic Studies of Poliomyelitis in New York City and the northeastern United States during the year 1916." By C. H. Lavinder, A. W. Freeman, and W. H. Frost. 1918.

<sup>2</sup> In view of the exclusion of the 1916 figures, the population statistics for the previous years were based on the census estimate of July 1, 1914, instead of 1915, as done in the case of the other diseases, and as explained on p. 265.

<sup>3</sup> A discussion of this point will be found on p. 18 of Public Health Bulletin No. 91, mentioned in footnote 1 on this page.

Two States, however, have had exceptionally high rates of reported prevalence during each year in which reports of this disease have been received from them by the service. As stated above, the average case rate for previous years (excluding 1916) for the States in which data were available was 0.035 and for the same States in 1917, 0.048. On the other hand, the rates in Vermont were: 1913, no data; 1914, 0.833; 1915, .116; 1916, 0.176; 1917, 0.471. In Virginia the rates were: 1913, 0.116; 1914, no data; 1915, 0.111; 1916, 0.151; 1917, 0.122. As a matter of interest, the fatality rates for the same years are given for Vermont: 1914, 17.28; 1915, 40.48; 1916, 18.75; 1917, 8.72. No fatality rates are available for Virginia for these years.

The highest rates of reported prevalence for 1917 are as follows: Vermont, 0.471; West Virginia, 0.235; Illinois, 0.137; Virginia, 0.122; Montana, 0.078; Iowa, 0.071; Ohio, 0.068; Maryland, 0.065; Pennsylvania, 0.064.

*Poliomyelitis (infantile paralysis).*

State.	1917					Annual averages.		
	Estimated population, July 1, 1917.	Cases reported.	Deaths registered.	Case rate per 1,000.	Fatality.	For the years—	Cases reported.	Case rate per 1,000.
					<i>Per ct.</i>			
Alabama.....	2,363,939	42	24	0.018	57.14	1915, 1916.....	97	0.042
Arkansas.....	1,766,343	8	14					
California.....	3,029,032	67	29	.022	43.28	1913-1916.....	85	.030
Colorado.....	988,320	8	1	.008	12.50	1916.....	16	.017
Connecticut.....	1,265,373	29	18	.023	62.07	1912-1916.....	211	.175
District of Columbia.....	369,282	6	2	.016	33.33	1912-1916.....	13	.037
Hawaii.....	219,580	2		.009		1912-1915.....	3	.015
Illinois.....	6,234,995	853	236	.137	27.67	1912-1914.....	249	.042
Indiana.....	2,815,492	69	33	.024	47.83	1912-1916.....	97	.035
Iowa.....	2,224,771	157		.071		1912-1914, 1916.....	101	.045
Kansas.....	1,851,870	74	17	.040	22.97	1912-1916.....	68	.038
Louisiana.....	1,856,954	11	56			1914-1916.....	31	.017
Maine.....	777,340	11	3	.014	27.27	1916.....	149	.193
Maryland.....	1,373,673	89	15	.065	16.85	1915, 1916.....	209	.154
Massachusetts.....	3,775,973	174	52	.046	29.89	1912, 1913, 1916.....	819	.223
Michigan.....	3,094,266	73	32	.024	43.84	1913-1916.....	198	.066
Minnesota.....	2,312,445	75	10	.032	13.33	1912-1916.....	230	.104
Mississippi.....	1,976,570	56	9	.028	16.07	1914-1916.....	156	.081
Montana.....	472,935	37	6	.078	16.22	1913, 1914, 1916.....	35	.080
Nevada.....	110,738					1913, 1915.....	3	.030
New Jersey.....	3,014,194	91	34	.030	37.36	1912-1916.....	848	.301
New York.....	10,460,182	295	94	.028	31.86	1912-1916.....	3,059	.309
North Dakota.....	765,319	36	6	.047	16.67			
Ohio.....	5,212,085	354	124	.068	35.03	1914-1916.....	358	.070
Oklahoma.....	2,289,855	20	9	.009	45.00	1912.....	14	.007
Oregon.....	861,992	20	1	.023	5.00	1913, 1915, 1916.....	14	.017
Pennsylvania.....	8,660,042	555	122	.064	21.98	1912, 1916.....	1,172	.142
Porto Rico.....	1,231,880							
Rhode Island.....	625,893	9		.014				
South Carolina.....	1,643,205	16	11	.010	68.75	1914-1916.....	49	.030
South Dakota.....	716,972	35	9	.049	25.71	1913.....	8	.012
Texas.....	4,515,423	11	21			1915.....	8	.002
Utah.....	443,866							
Vermont.....	364,946	172	15	.471	8.72	1914-1916.....	136	.375
Virginia.....	2,213,025	269		.122		1912, 1913, 1915, 1916.....	261	.121
Washington.....	1,597,400							
West Virginia.....	1,412,602	332	38	.235	11.45			
Wisconsin.....	2,527,167	57	24	.023	42.11	1913-1916.....	148	.060
Wyoming.....	184,970	1		.005		1916.....	7	.039

## RABIES IN MAN.

Deaths from rabies registered during 1917 were: South Carolina, 6; New York, 5; Ohio and Louisiana, 4 each; Connecticut, Illinois, New Jersey, Pennsylvania, and Wisconsin, 3 each; Colorado, Indiana, Minnesota, and Texas, 2 each; Alabama, 1; total, 43.

## ROCKY MOUNTAIN SPOTTED FEVER.

Fifty-six cases of Rocky Mountain spotted fever were reported to the service for 1917 by far Western and Northwestern States. Thirty-two deaths from the disease were registered in these States, giving a fatality rate of 57.14 per cent.

The highest case rates were reported from Nevada (0.108 per 1,000 population) Utah (0.034), and Montana (0.030). In Wyoming, however, 3 cases and 13 deaths were reported as occurring, giving a death rate of 0.070 per 1,000.

Of the States in which a considerable number of cases were reported, fatality rates are available for only Nevada and Montana. They are, respectively, 16.67 per cent and 57.14 per cent, or a joint rate of 38.46 per cent.

The reported cases of spotted fever all occurred in the months from April to September, as follows: April, 6; May, 16; June, 17; July, 14; August, 2; September, 1.

## SCARLET FEVER.

In the 39 States reporting scarlet fever cases for 1917, a total of 119,945 cases were recorded as occurring, giving a case rate of 1.369 per 1,000 population. The average indicated fatality rate for 36 States was 2.73 per cent. In the 36 States for which reports of cases were received for 1917 and for at least one previous year, 118,576 cases were reported for 1917 and 94,510 cases for the previous years, giving case rates, respectively, of 1.417 and 1.167 per 1,000 population.

The highest case rate in 1917 was in Utah (5.396); Utah also had the highest average for the previous years (2.195).

Since lower fatality rates are generally recognized as indicating more complete reporting of a disease, there are given below the case rates for 1917 for those States which had fatality rates for the same year of less than 2 per cent: Utah, 5.396; Kansas, 1.885; New Jersey, 1.585; District of Columbia, 1.582; Massachusetts, 1.577; California, 1.460; New York, 1.456; Connecticut, 1.208; South Dakota, 1.109; Oregon, 1.097; Maryland, 0.979; North Dakota, 0.691; Colorado, 0.720; Washington, 0.636; Oklahoma, 0.574; and Mississippi, 0.275.

State.	1917					Annual averages.		
	Estimated population July 1, 1917.	Cases reported.	Deaths registered.	Case rate per 1,000.	Fatality, per cent.	For the years—	Cases reported.	Case rate per 1,000.
Alabama.....	2,363,939	821	295	0.347	35.93	1913, 1915, 1916.....	635	0.277
Arkansas.....	1,766,343	254	14	.144	5.51			
California.....	3,029,032	4,422	49	1.460	1.11	1913-1916.....	2,828	1.009
Colorado.....	988,320	712	12	.720	1.69	1914, 1916.....	1,082	1.156
Connecticut.....	1,265,373	1,528	17	1.208	1.11	1912-1916.....	1,829	1.521
District of Columbia.....	369,282	584	8	1.582	1.37	1912-1916.....	490	1.387
Hawaii.....	219,580	7	1	.032	14.29	1912-1916.....	11	.053
Illinois.....	6,234,995	19,825	791	3.180	3.99	1912-1914.....	11,534	1.954
Indiana.....	2,835,492	4,832	143	1.704	2.96	1913-1916.....	4,326	1.551
Iowa.....	2,224,771	1,566		.704		1912-1914, 1916.....	1,108	.499
Kansas.....	1,851,870	3,490	54	1.885	1.55	1912-1916.....	1,567	.878
Louisiana.....	1,856,954	195	6	.105	3.08	1914-1916.....	194	.108
Maine.....	777,340	145	5	.187	3.45	1916.....	215	.278
Maryland.....	1,373,673	1,345	22	.979	1.64	1915, 1916.....	2,189	1.613
Massachusetts.....	3,775,973	5,953	118	1.577	1.98	1912, 1913, 1916.....	6,655	1.856
Michigan.....	3,094,266	11,727	322	3.790	2.75	1913-1916.....	4,141	1.382
Minnesota.....	2,312,445	3,331	89	1.441	2.67	1912-1916.....	3,944	1.781
Mississippi.....	1,976,570	544	9	.275	1.65	1914-1916.....	469	.243
Montana.....	472,935	1,435	79	3.034	5.51	1912-1914, 1916.....	614	1.430
Nevada.....	110,738	113	5	1.021	4.42	1913, 1915.....	198	2.006
New Jersey.....	3,014,194	4,776	49	1.585	1.03	1912-1916.....	4,804	1.706
New York.....	10,460,182	15,234	261	1.456	1.71	1912-1916.....	16,294	1.646
North Dakota.....	765,319	529	1	.691	.19			
Ohio.....	5,212,085	9,846	197	1.889	2.00	1914-1916.....	8,622	1.694
Oklahoma.....	2,289,855	1,314	12	.574	.91	1912, 1913, 1915.....	1,366	.694
Oregon.....	861,992	946	14	1.097	1.48	1912-1916.....	531	.678
Pennsylvania.....	8,660,042	8,444	216	.975	2.56	1912, 1916.....	8,260	1.002
Porto Rico.....	1,231,880	1		.001		1914.....	3	.003
Rhode Island.....	625,863	538		.860		1914, 1916.....	1,031	1.710
South Carolina.....	1,643,205	188	8	.114	4.26	1913-1916.....	285	.178
South Dakota.....	716,972	795	4	1.109	.50	1913, 1914.....	451	.691
Texas.....	4,515,423	1,217	52	.270	4.27	1915.....	1,711	.394
Utah.....	443,866	2,395	38	5.396	1.59	1912-1915.....	899	2.195
Vermont.....	364,946	895	19	2.452	2.12	1914-1916.....	474	1.308
Virginia.....	2,213,025	970		.438		1912, 1914-1916.....	1,916	.889
Washington.....	1,597,400	1,016	20	.636	1.97	1913-1916.....	729	.506
West Virginia.....	1,412,602	586	21	.415	3.58			
Wisconsin.....	2,527,167	7,038	228	2.785	3.24	1913-1916.....	2,973	1.208
Wyoming.....	184,970	388	14	2.098	3.61	1913-1916.....	132	.770

## SEPTIC SORE THROAT.

For 1917, 1,860 cases were reported from 15 States as septic sore throat, and 176 deaths were registered as due to this cause. The average indicated fatality in the States that recorded both cases and deaths was 11.62 per cent.

The highest case rates were 1.008 (Vermont, with a fatality rate of 2.45); 0.129 (Wisconsin, with a fatality rate of 3.38); 0.077 (Illinois, with a fatality rate of 12.86); and 0.072 (Massachusetts, with a fatality rate of 20).

The seasonal distribution of the cases reported for 1917 is as follows: January, 333; February, 141; March, 580; April, 265; May, 53; June, 84; July, 137; August, 70; September, 25; October, 27; November, 64; and December, 81.

## SMALLPOX.

In the 37 States for which reports of smallpox were received in 1917, 45,137 cases were reported as occurring, giving a case rate of 0.520 per 1,000 population. The average indicated fatality rate for 35 States was 0.70 per cent. In the 33 States from which data as to

cases were available for both 1917 and at least one previous year, 42,023 cases were reported as occurring in 1917 and the average for the previous years was reported as 35,432, giving case rates, respectively, of 0.515 and 0.449.

The indicated fatality rates for 1917 varied from 15.39 per cent in Massachusetts to 0.15 per cent in Kansas. The second highest rate was that of Texas, where 1,350 cases and 148 deaths were reported as occurring. No other State registered more than 20 deaths, and only 149 deaths were registered in the other 34 States from which records of deaths from smallpox were received.

The highest rates of reported smallpox prevalence were as follows: Montana, 2.943; Utah, 2.028; South Dakota, 1.823; Indiana, 1.620; Oklahoma, 1.553; Kansas, 1.416; Minnesota, 1.175; Arkansas, 1.141; Ohio, 1.006. The lowest rates were: New Jersey, 0.002; Massachusetts, 0.017; District of Columbia, 0.030; New York, 0.032; Pennsylvania, 0.044; Porto Rico, 0.069; South Carolina, 0.069; and Maryland, 0.071. The extreme contrast between the case rates of the two groups and between the geographical locations of the States comprising the two groups is of interest in connection with the study of the enforcement and nonenforcement of vaccination laws in different parts of the country.

State.	1917					Annual averages.		
	Estimated population July 1, 1917.	Cases reported.	Deaths registered.	Case rate per 1,000.	Fatality, per cent.	For the years—	Cases reported.	Case rate per 1,000.
Alabama.....	2,363,939	636	3	0.269	0.47	1913, 1915, 1916.....	619	0.270
Arkansas.....	1,766,343	2,016	5	1.141	.25	1913-1916.....	537	.192
California.....	3,029,032	329	13	.109	3.95	1913, 1914, 1916.....	277	.302
Colorado.....	988,320	323	1	.327	.31	1913-1916.....	120	.099
Connecticut.....	1,265,373	423	.....	.334	.....	1913-1916.....	77	.216
District of Columbia.....	369,282	11	.....	.030	.....	.....	.....	.....
Hawaii.....	219,580	.....	.....	.....	.....	.....	.....	.....
Illinois.....	6,234,995	4,996	10	.801	.20	1913, 1914.....	3,230	.543
Indiana.....	2,835,492	4,593	13	1.620	.29	1913-1916.....	2,940	1.054
Iowa.....	2,224,771	2,127	.....	.956	.....	1913, 1914, 1916.....	2,255	1.015
Kansas.....	1,851,870	2,623	4	1.416	.15	1913-1916.....	1,843	1.026
Louisiana.....	1,856,954	835	4	.450	.48	1914-1916.....	585	.325
Maine.....	777,340	600	.....	.772	.....	.....	.....	.....
Maryland.....	1,373,673	98	1	.071	1.02	1915, 1916.....	81	.060
Massachusetts.....	3,775,973	65	10	.017	15.39	1913, 1916.....	94	.026
Michigan.....	3,094,266	2,929	8	.947	.27	1913-1916.....	1,424	.475
Minnesota.....	2,312,445	2,718	20	1.175	.74	1913-1916.....	1,923	.862
Mississippi.....	1,976,570	1,530	3	.774	.20	1914-1916.....	1,678	.871
Montana.....	472,935	1,392	5	2.943	.36	1913, 1914, 1916.....	857	1.961
Nevada.....	110,738	22	.....	.199	.....	1913, 1915.....	172	1.742
New Jersey.....	3,014,194	6	.....	.002	.....	1913-1916.....	62	.023
New York.....	10,460,182	333	4	.032	1.20	1913-1916.....	451	.045
North Dakota.....	765,319	365	.....	.738	.....	1913.....	395	.598
Ohio.....	5,212,085	5,242	9	1.006	.17	1913-1916.....	3,123	.614
Oklahoma.....	2,289,855	3,557	11	1.553	.31	1913, 1915.....	2,826	1.394
Oregon.....	861,992	122	.....	.142	.....	1913-1916.....	544	.683
Pennsylvania.....	8,660,042	380	6	.044	1.58	1916.....	97	.011
Porto Rico.....	1,231,880	85	2	.069	2.35	.....	.....	.....
Rhode Island.....	625,863	.....	.....	.....	.....	.....	.....	.....
South Carolina.....	1,643,205	114	.....	.069	.....	1913-1916.....	450	.281
South Dakota.....	716,972	1,307	9	1.823	.69	1913, 1914.....	943	1.446
Texas.....	4,515,423	1,350	148	.299	10.96	1913, 1915.....	1,901	.446
Utah.....	443,866	900	4	2.028	.44	1913-1915.....	1,346	3.247
Vermont.....	364,946	66	.....	.181	.....	1913-1916.....	131	.362
Virginia.....	2,213,025	726	.....	.328	.....	1913-1916.....	1,542	.714
Washington.....	1,597,400	390	1	.244	.26	1913-1916.....	815	.566
West Virginia.....	1,412,602	413	.....	.292	.....	.....	.....	.....
Wisconsin.....	2,527,167	1,250	3	.495	.24	1913-1916.....	2,009	.817
Wyoming.....	181,970	65	.....	.351	.....	1913-1916.....	85	.496



VACCINATION STATUS OF REPORTED CASES.<sup>1</sup>

A number of State departments of health endeavor to ascertain the vaccination histories of all persons contracting smallpox. Up to the present time, reports in regard to this point have been received by the service as follows: Cases reported, 54,725; deaths, 63; number vaccinated within seven years preceding attack, 1,045; number last vaccinated more than seven years preceding attack, 2,419; number never successfully vaccinated, 32,688; vaccination history not obtained or uncertain, 18,573. These data will be found for each State reporting them, for the years 1912-1916, on page 281 of the last annual report of the service. The same data for 1917 are given in the following table:

State.	Cases reported.	Vaccination history of cases.				
		Deaths.	Number vaccinated within seven years preceding attack.	Number last vaccinated more than seven years preceding attack.	Number never successfully vaccinated.	Vaccination history not obtained or uncertain.
California.....	327	.....	5	30	260	32
District of Columbia.....	11	.....	.....	.....	11	.....
Kansas.....	2,577	.....	13	71	2,485	8
Maryland.....	95	.....	.....	.....	95	.....
Massachusetts.....	65	8	7	26	30	2
Michigan.....	2,663	1	12	57	2,298	296
Minnesota.....	2,656	9	45	170	2,392	49
Ohio.....	4,704	.....	10	60	2,269	2,356
Total.....	13,098	18	92	423	9,840	2,743

## TRACHOMA.

An examination of 205 school children in Camden, Wilcox County, Ala., disclosed two cases of trachoma and one case classified as doubtful. The population of Camden in 1910 was 648.

The prevalence of trachoma in Florida was investigated by a service officer in conjunction with officers of the State Board of Health of Florida and assisted by local doctors. In six towns and cities, with a total population of 105,739,290 cases of trachoma were found, giving a case rate of 2.743 per 1,000 population.

## TUBERCULOSIS.

In view of the incompleteness of reports of tuberculosis, no totals are presented in regard to the reports of this disease received by the service. The highest case rates for 1917 (all forms) were in Hawaii (4.331), Mississippi (3.467), New York (2.742), District of Columbia (2.716), New Jersey (2.713).

For pulmonary tuberculosis, the highest case rates for 1917 were those of Hawaii (4.117), New York (2.684), Maryland (2.334), Massachusetts (2.215).

<sup>1</sup>These statistics have been prepared from monthly reports as received currently from the States, and do not include all the cases of final record in the various States.

## PULMONARY.

State.	1917					1916	
	Estimated population July 1, 1917.	Cases reported.	Deaths registered.	Case rate per 1,000 population.	Cases reported for each death.	Cases reported.	Case rate per 1,000 population.
Alabama.....	2,363,939	3,169	2,688	1.341	1.18	2,809	1.204
California.....	3,029,032						
Colorado.....	988,320						
Connecticut.....	1,265,373						
District of Columbia.....	369,282						
Hawaii.....	219,580	904	394	4.117	2.29	855	3.963
Illinois.....	6,234,995	12,710	7,114	2.038	1.79		
Indiana.....	2,835,492	3,267	3,433			2,455	
Iowa.....	2,224,771						
Kansas.....	1,851,870						
Louisiana.....	1,856,954						
Maine.....	777,340						
Maryland.....	1,373,673	3,206	2,564	2.334	1.25	3,287	2.412
Massachusetts.....	3,775,973	8,365	4,638	2.215	1.80	7,878	2.118
Michigan.....	3,094,266						
Minnesota.....	2,312,445	4,806	1,849	2.078	2.60	4,152	1.821
Mississippi.....	1,976,570						
Montana.....	472,935	245	383			289	
Nevada.....	110,738	64	44	.578	1.45		
New Jersey.....	3,014,194						
New York.....	10,460,182	28,080	14,739	2.684	1.91	29,872	2.908
North Dakota.....	765,319	174	264				
Ohio.....	5,212,085						
Oklahoma.....	2,289,855						
Oregon.....	861,992						
Pennsylvania.....	8,600,042						
Porto Rico.....	1,231,880						
Rhode Island.....	625,865	848		1.355	1.01	859	1.398
South Carolina.....	1,643,205	267	1,623				
South Dakota.....	716,972	146	91	.204	1.60		
Texas.....	4,515,423						
Utah.....	443,866	60	154				
Vermont.....	364,946	262	269			320	.880
Virginia.....	2,213,025						
Washington.....	1,597,400	1,173	1,008	.734	1.16	1,082	.705
West Virginia.....	1,412,602	368	478				
Wisconsin.....	2,527,167						
Wyoming.....	184,970						

## ALL FORMS.

Alabama.....	2,363,939						
Arkansas.....	1,766,343	597	1,084				
California.....	3,029,032	7,017	5,450	2.317	1.29	6,980	2.375
Colorado.....	988,320						
Connecticut.....	1,265,373	1,795	2,032				
District of Columbia.....	369,282	1,003		2.716		1,061	2.915
Hawaii.....	219,580	951	460	4.331	2.07	957	4.436
Illinois.....	6,234,995	13,999	8,065	2.245	1.74		
Indiana.....	2,835,492	3,875	3,977				
Iowa.....	2,224,771						
Kansas.....	1,851,870	1,527	1,018	.825	1.50	1,363	.745
Louisiana.....	1,856,954	1,879	2,784				
Maine.....	777,340	503	878				
Maryland.....	1,373,673						
Massachusetts.....	3,775,973	9,141	5,402	2.421	1.69	8,537	2.295
Michigan.....	3,094,266	4,856	3,199	1.570	1.52	7,076	2.316
Minnesota.....	2,312,445	5,166	2,353	2.234	2.20	4,649	2.039
Mississippi.....	1,976,570	6,852	2,743	3.467	2.50		
Montana.....	472,935						
Nevada.....	110,738						
New Jersey.....	3,014,194	8,177	4,617	2.713	1.77	9,017	3.059
New York.....	10,460,182	28,686	16,556	2.742	1.73	30,540	2.973
North Dakota.....	765,319	199	288				
Ohio.....	5,212,085	6,454	7,453			5,997	
Oklahoma.....	2,289,855	501	654				
Oregon.....	861,992	684	595	.794	1.15	447	
Pennsylvania.....	8,600,042	11,610	11,513	1.341	1.01	11,305	1.327
Porto Rico.....	1,231,880	951	2,707				
Rhode Island.....	625,865	898		1.435		908	
South Carolina.....	1,643,205						
South Dakota.....	716,972	157	98	.219	1.60		
Texas.....	4,515,423	1,239	3,917				
Utah.....	443,866						
Vermont.....	364,946						
Virginia.....	2,213,025	3,157		1.427		3,584	
Washington.....	1,597,400	374	531				
West Virginia.....	1,412,602						
Wisconsin.....	2,527,167	2,103	2,397			1,497	
Wyoming.....	184,970						

## TYPHOID FEVER.

In the 38 States from which reports were received, 55,417 cases of typhoid fever were reported as occurring in 1917, giving a case rate of 0.649 per 1,000 population. The average indicated fatality rate for 35 States was 19.47 per cent. If the case rates of 1917 and previous years are compared, it is found that in 35 States for which the data are available, 52,883 cases are reported as occurring in 1917 and 61,649 is the average number reported for the previous years, giving case rates, respectively, of 0.649 and 0.783 per 1,000 population.

The highest case rates in 1917 were in Mississippi (2.698 per 1,000 with a fatality rate of 10.38), Maryland (1.704 with a fatality rate of 10.55), Virginia (1.549, fatality rate not obtainable), Alabama (1.547 with a fatality rate of 24.56). The highest case rates recorded for the average number of cases reported in previous years are: Mississippi (3.178), Maryland (2.161), Virginia (2.127), Nevada (1.590). It will be noticed that the highest rates of reported prevalence occur in practically the same States in 1917 as when the previous years are averaged together. The following table, giving the figures for each year, shows this fact more graphically:

1917—Mississippi-----	2. 698	1915—Mississippi-----	3. 196
Maryland-----	1. 704	Maryland-----	2. 365
Virginia-----	1. 549	Virginia-----	2. 035
Alabama-----	1. 547	Nevada-----	1. 256
1916—Mississippi-----	3. 092	1914—Mississippi-----	3. 249
Maryland-----	1. 958	Virginia-----	1. 825
Virginia-----	1. 924	Utah-----	1. 612
Alabama-----	1. 540	Maryland-----	1. 387

Since lower fatality rates are generally recognized as indicating more complete reporting of a disease, the case rates for 1917 are given herewith for those States which had indicated fatality rates for that year of less than 15 per cent: Mississippi, 2.698; Maryland, 1.704; Kansas, 1.368; Montana, 1.138; West Virginia, 1.082; Utah, 1.059; District of Columbia, 0.916; Washington, 0.615; New York, 0.410; Massachusetts, 0.409; Minnesota, 0.321; and South Dakota, 0.144.

State.	1917					Annual averages.		
	Estimated population July 1, 1917	Cases reported.	Deaths registered.	Case rate per 1,000.	Fatality, per cent.	For the years—	Cases reported.	Case rate per 1,000.
Alabama.....	2,363,939	3,656	898	1.547	24.56	1913, 1915, 1916.....	2,304	1.006
Arkansas.....	1,766,343	774	264	.438	34.11	.....	.....	.....
California.....	3,029,032	1,418	220	.468	15.52	1913-1916.....	1,406	.502
Colorado.....	988,320	420	88	.425	20.95	1914, 1916.....	590	.630
Connecticut.....	1,265,373	508	112	.401	22.05	1912-1916.....	826	.687
Distriet of Columbia.....	369,282	338	49	.915	14.50	1912-1916.....	411	1.163
Hawaii.....	219,580	324	58	1.476	17.90	1912-1916.....	184	.884
Illinois.....	6,234,995	2,343	520	.376	22.19	1912-1914.....	4,335	.734
Indiana.....	2,835,492	1,966	497	.693	25.28	1913-1916.....	2,662	.956
Iowa.....	2,224,771	.....	.....	.....	.....	.....	.....	.....
Kansas.....	1,851,870	2,534	329	1.368	12.98	1912-1916.....	1,539	.862
Louisiana.....	1,854,954	1,583	318	.852	32.72	1914-1916.....	818	.454
Maine.....	777,340	169	82	.217	48.52	1916.....	316	.409
Maryland.....	1,373,673	2,341	247	1.704	10.55	1915, 1916.....	2,933	2.161
Massachusetts.....	3,775,973	1,546	178	.409	11.51	1912, 1913, 1916.....	2,000	.558
Michigan.....	3,094,296	1,569	388	.507	24.73	1913-1916.....	2,053	.685
Minnesota.....	2,312,445	743	99	.321	13.32	1912-1916.....	1,176	.531
Mississippi.....	1,976,570	5,333	554	2.698	10.38	1914-1916.....	6,124	3.178
Montana.....	472,935	538	77	1.138	14.31	1912-1914, 1916.....	435	1.013
Nevada.....	110,738	77	15	.695	19.48	1913, 1915.....	157	1.590
New Jersey.....	3,014,194	1,151	191	.382	16.59	1912-1916.....	1,539	.547
New York.....	10,460,182	4,293	591	.410	13.77	1912-1916.....	5,600	.566
North Dakota.....	765,319	231	.....	.302	.....	.....	.....	.....
Ohio.....	5,212,085	3,127	690	.600	22.07	1914-1916.....	4,523	.889
Oklahoma.....	2,289,855	1,594	360	.696	22.58	1912, 1913, 1915.....	2,072	1.053
Oregon.....	891,492	332	83	.385	25.00	1912-1916.....	262	.335
Pennsylvania.....	8,660,042	5,063	832	.585	17.62	1912-1916.....	7,520	.912
Porto Rico.....	1,231,880	205	181	.166	88.29	1914, 1915.....	415	.348
Rhode Island.....	625,863	157	.....	.251	.....	1914, 1916.....	287	.476
South Carolina.....	1,643,205	587	444	.357	75.64	1913-1916.....	1,073	.671
South Dakota.....	716,972	103	13	.144	12.62	1913, 1914.....	142	.218
Texas.....	4,515,423	1,256	868	.278	69.11	1915.....	1,038	.239
Utah.....	443,866	470	61	1.059	12.98	1912-1915.....	641	1.565
Vermont.....	364,946	140	23	.384	16.43	1914-1916.....	256	.706
Virginia.....	2,213,025	3,427	.....	1.549	.....	1912-1916.....	4,572	2.127
Washington.....	1,597,400	983	120	.615	12.20	1913-1916.....	725	.504
West Virginia.....	1,412,602	1,529	164	1.082	10.73	.....	.....	.....
Wisconsin.....	2,527,167	486	133	.192	27.37	1913-1916.....	657	.267
Wyoming.....	184,970	103	42	.557	40.78	1913-1916.....	58	.338

#### TYPHUS FEVER.

A total of 58 cases of typhus fever were reported and 20 deaths registered from the States of California, Colorado, Mississippi, New York, and Texas for the calendar year 1917. In 1916 59 cases were reported from 3 States.

Texas reported 38 cases and 17 deaths for 1917, giving a case rate of 0.0084 per 1,000 population and a fatality rate of 44.74 per cent. New York reported 13 cases and 3 deaths, giving a fatality rate of 23.08. California, which reported 28 cases in 1916, reported but 3 in 1917.

#### PREVALENCE OF DISEASE IN EXTRA CANTONMENT ZONES.

The following tables give the cases of diphtheria, malaria, measles, meningitis, smallpox, and typhoid fever reported from the different extra-cantonment zones established by the service in cooperation with State and local health authorities and the Red Cross. The period covered is from January 2 to June 29, 1918.

Since population figures are not available for these zones, which do not correspond to geographical divisions recognized by the census and the populations of which have greatly changed since the estab-

lishment of the camps, no case rates can be given for these zones. The total number of cases reported for all the zones for the six months' period are: Measles, 7,628; small pox, 2,699; malaria, 1,289; typhoid fever, 844; diphtheria, 757; and meningitis, 580. In the following table is given the number of cases reported for each of these diseases for the different periods:

Disease.	Cases reported.					
	4 weeks, Jan. 2 to Jan. 29.	4 weeks, Jan. 30 to Feb. 26.	4 weeks, Feb. 27 to Mar. 26.	5 weeks, Mar. 27 to Apr. 30.	4 weeks, May 1 to May 28.	May 29 to June 29.
Diphtheria.....	149	134	124	140	83	127
Malaria.....	28	44	64	351	351	451
Measles.....	2,096	1,750	1,408	1,488	630	256
Meningitis.....	154	168	115	79	37	27
Smallpox.....	514	645	528	460	370	182
Typhoid fever.....	47	25	66	106	138	462

The following tables give the number of cases of each of these diseases occurring in each zone for the different periods:

*Cases of disease reported in extra-cantonment zones Jan. 2 to June 29, 1918.*

## DIPHTHERIA.

Zone.	Cases reported.					
	4 weeks, Jan. 2 to Jan. 29.	4 weeks, Jan. 30 to Feb. 26.	4 weeks, Feb. 27 to Mar. 26.	5 weeks, Mar. 27 to Apr. 30.	4 weeks, May 1 to May 28.	May 29 to June 29.
Beauregard zone, La.....	3	2		4		
Bowie zone, Tex.....	1	7	12	1	2	5
Devens zone, Mass.....					1	1
Dodge zone, Iowa.....	11	14	14	20	15	18
Eberts zone, Ark.....					1	2
Funston zone, Kans.....	7	2	2	2	1	
Gordon zone, Ga.....	44	25	16	7	9	2
Greene zone, N. C.....	1	2	4	3	4	1
Gulfport health district, Miss.....				1		2
Hancock zone, Ga.....			2			1
Jackson zone, S. C.....			4	2	2	2
Joseph E. Johnston zone, Fla.....				2		1
Leavenworth zone, Kans.....	7	5	2	13	3	17
Lee zone, Va.....		1	3	3	2	1
Lewis zone, Wash.....						
Logan zone, Tex.....	5	7	3	7	4	2
MacArthur zone, Tex.....		3	1			1
McClellan zone, Ala.....	3	1	3	2	2	2
Norfolk County health district, Va.....			4	5	3	3
Oglethorpe zone, Ga. and Tenn.....	4	5	1	2	1	
Pike zone, Ark.....	2	5	6	8	2	2
Sevier zone, S. C.....						
Shelby zone, Miss.....	10	6	2			
Sheridan zone, Ala.....	4	2	3	2		1
Sherman zone, Ohio.....	3	5	11	2	5	24
Zachary Taylor zone, Ky.....	35	32	22	43	20	31
Tidewater health district, Va.....	1	1	1	2		1
Travis zone, Tex.....				1	4	2
Wadsworth zone, S. C.....	3	2	7	7	2	2
Wheeler zone, Ga.....	5	7	1	1		3

*Cases of diseases reported in extra-county zones Jan. 2 to June 29, 1918—*  
Continued.

## MALARIA.

Zone.	Cases reported.					
	4 weeks, Jan. 2 to Jan. 29.	4 weeks, Jan. 30 to Feb. 26.	4 weeks, Feb. 27 to Mar. 26.	5 weeks, Mar. 27 to Apr. 30.	4 weeks, May 1 to May 28.	May 29 to June 29.
Beauregard zone, La.	1	1		8	19	27
Bowie zone, Tex.			3		5	2
Devens zone, Mass.						
Dodge zone, Iowa						
Eberts zone, Ark.				112	44	101
Funston zone, Kans.	1					
Gordon zone, Ga.		3	3	3	2	11
Greene zone, N. C.			6	2		
Gulfport health district, Miss.				25	31	51
Hancock zone, Ga.				5	3	4
Jackson zone, S. C.					1	
Joseph E. Johnston zone, Fla.			6	18	6	11
Leavenworth zone, Kans.						
Lee zone, Va.	3		2	4	8	4
Lewis zone, Wash.						
Logan zone, Tex.	2	1	1	12	10	1
MacArthur zone, Tex.	2	2			1	2
McClellan zone, Ala.					2	7
Norfolk County health district, Va.			3	7	11	11
Oglethorpe zone, Ga. and Tenn.					1	
Pike zone, Ark.	9	16	25	32	49	69
Sevier zone, S. C.						2
Shelby zone, Miss.	10	19	7	53	20	60
Sheridan zone, Ala.				65	119	69
Sherman zone, Ohio.						
Zachary Taylor zone, Ky.				2	2	3
Tidewater health district, Va.						
Travis zone, Tex.			7	2	6	10
Wadsworth zone, S. C.						
Wheeler zone, Ga.		2	1	1	11	6

## MEASLES.

Beauregard zone, La.	173	66	10	5	6	1
Bowie zone, Tex.	27	13	5	2	10	6
Devens zone, Mass.			36	45	37	17
Dodge zone, Iowa	17	88	55	22	1	12
Eberts zone, Ark.				102	53	25
Funston zone, Kans.	558	383	114	76	21	3
Gordon zone, Ga.	55	46	45	63	41	40
Greene zone, N. C.	153	99	32	47	21	17
Gulfport health district, Miss.				30	10	3
Hancock zone, Ga.	149	120	71	94	28	15
Jackson zone, S. C.			20	16	10	4
Joseph E. Johnston zone, Fla.			66	59	42	9
Leavenworth zone, Kans.	30	25	31	140	46	6
Lee zone, Va.	45	112	133	71	13	1
Lewis zone, Wash.			3	4	4	1
Logan zone, Tex.	91	89	184	119	31	3
MacArthur zone, Tex.	14	55	54	47	5	1
McClellan zone, Ala.	53	29	65	17	10	6
Norfolk County health district, Va.			66	97	79	15
Oglethorpe zone, Ga., and Tenn.	57	24	39	10	3	4
Pike zone, Ark.	120	114	26	19	15	8
Sevier zone, S. C.	19	6	12	27	2	
Shelby zone, Miss.	60	16	7	4	1	1
Sheridan zone, Ala.	117	114	45	39	18	1
Sherman zone, Ohio.	45	29	49	91	18	7
Zachary Taylor zone, Ky.	124	166	82	74	34	20
Tidewater health district, Va.	94	68	81	97	26	8
Travis zone, Tex.			12	37	19	3
Wadsworth zone, S. C.	7	52	49	29	22	17
Wheeler zone, Ga.	88	36	16	5	4	2

*Cases of diseases reported in extra-cantonment zones Jan. 2 to June 29, 1918—*  
Continued.

## CEREBROSPINAL MENINGITIS.

Zone.	Cases reported.					
	4 weeks, Jan. 2 to Jan. 29.	4 weeks, Jan. 30 to Feb. 26.	4 weeks, Feb. 27 to Mar. 26.	5 weeks, Mar. 27 to Apr. 30.	4 weeks, May 1 to May 28.	May 29 to June 29.
Beauregard zone, La.	30	8	1	3	1	1
Bowie zone, Tex.	5	5	5	2	1	
Devens zone, Mass.						
Dodge zone, Iowa	2	1	3		1	
Eberts zone, Ark.				5		
Funston zone, Kans.	1	4	1	1	3	
Gordon zone, Ga.	17	28	5	8	1	2
Greene zone, N. C.	11	7	2	2		
Gulfport health district, Miss.				2		
Hancock zone, Ga.	4	13	3	2	2	1
Jackson zone, S. C.			4	2	2	
Joseph E. Johnston zone, Fla.				1		1
Leavenworth zone, Kans.	1	1	2			
Lee zone, Va.	1	4	4	1	2	1
Lewis zone, Wash.					1	
Logan zone, Tex.	4		4	2		1
MacArthur zone, Tex.	3	5	2			
McClellan zone, Ala.	3	6	2			
Norfolk County health district, Va.			10	2	4	1
Oglethorpe zone, Ga. and Tenn.	9	16	3	9	3	3
Pike zone, Ark.	18	12	17	4	6	1
Sevier zone, S. C.	3	3	5	5	2	3
Shelby zone, Miss.	4	6	1			1
Sheridan zone, Ala.	1	6	4		2	1
Sherman zone, Ohio.	1	2	1			
Zachary Taylor zone, Ky.	5	11	6	10	2	4
Tidewater health district, Va.	4	8	11	11	2	2
Travis zone, Tex.			2	2		4
Wadsworth zone, S. C.	10	3	3	1		
Wheeler zone, Ga.	17	19	3	3	1	

## SMALLPOX.

Beauregard zone, La.	7	9	10	18	13	7
Bowie zone, Tex.	26	40	17	26	100	53
Devens zone, Mass.						
Dodge zone, Iowa	176	130	112	90	55	33
Eberts zone, Ark.				44	17	8
Funston zone, Kans.	11	64	18	6	9	2
Gordon zone, Ga.	8	14	23	15	20	34
Greene zone, N. C.	2	4	4	5		
Gulfport health district, Miss.				1		
Hancock zone, Ga.		1	1			
Jackson zone, S. C.					1	
Joseph E. Johnston zone, Fla.			2	4	2	2
Leavenworth zone, Kans.	16	27	20	20	17	8
Lee zone, Va.					2	
Lewis zone, Wash.						
Logan zone, Tex.	2	20	13	1	3	1
MacArthur zone, Tex.	2	6	7	12	8	2
McClellan zone, Ala.	38	48	104	53	11	6
Norfolk County health district, Va.			9	3	3	2
Oglethorpe zone, Ga. and Tenn.	4	16	15	20	18	3
Pike zone, Ark.	144	111	95	69	32	7
Sevier zone, S. C.			1		2	2
Shelby zone, Miss.	35	67	17	10	1	
Sheridan zone, Ala.	33	56	29	13	9	
Sherman zone, Ohio.	1		1	7	5	
Zachary Taylor zone, Ky.	7	17	12	21	17	4
Tidewater health district, Va.			5	10	5	3
Travis zone, Tex.						
Wadsworth zone, S. C.	2	4	9	6	4	3
Wheeler zone, Ga.		11	4	6	16	2

*Cases of diseases reported in extra-cantonment zones Jan. 2 to June 29, 1918—*  
Continued.

## TYPHOID FEVER.

Zone.	Cases reported.					
	4 weeks, Jan. 2 to Jan. 29.	4 weeks, Jan. 30 to Feb. 26.	4 weeks, Feb. 27 to Mar. 26.	5 weeks, Mar. 27 to Apr. 30.	4 weeks, May 1 to May 28.	May 29 to June 29.
Beanregard zone, La.....	2	3	1	3	6	7
Bowie zone, Tex.....		2	2	5	10	43
Devens zone, Mass.....						
Dodge zone, Iowa.....	4	1	1	3	6	7
Eberts zone, Ark.....				2	3	2
Funston zone, Kans.....	2		3			
Gordon zone, Ga.....	6	1	3	16	4	24
Greene zone, N. C.....	1		5	2	1	22
Gulfport health district, Miss.....					4	25
Hancock zone, Ga.....	2	2	1	1	2	17
Jackson zone, S. C.....			5		6	12
Joseph E. Johnston zone, Fla.....			13	10	24	23.
Leavenworth zone, Kans.....	3	1	1	2	4	1
Lee zone, Va.....	4		2	1	1	4
Lewis zone, Wash.....						
Logan zone, Tex.....	2	4	5	3	3	17
MacArthur zone, Tex.....	2	1	1	6	2	23
McClellan zone, Ala.....	1		1	1		16
Norfolk County health district, Va.....				1	2	16
Oglethorpe zone, Ga. and Tenn.....	1		4	2	3	4
Pike zone, Ark.....	2	1	4	9	1	8
Sevier zone, S. C.....				2		6
Shelby zone, Miss.....	1			3	2	14
Sheridan zone, Ala.....		2			4	23.
Sherman zone, Ohio.....	2			3		2
Zachary Taylor zone, Ky.....	9	3	2	11	9	24
Tidewater health district, Va.....	1	4		8	2	13
Travis zone, Tex.....			4	9	34	86
Wadsworth zone, S. C.....	2		4			11
Wheeler zone, Ga.....			4	3	5	12

### WORLD PREVALENCE OF CHOLERA, PLAGUE, TYPHUS FEVER, AND YELLOW FEVER.

The following statement of the prevalence of certain communicable diseases throughout the world during the present period of war (from July 1, 1917, to June 30, 1918) must be considered as of value rather as showing the continued prevalence of these diseases in certain areas and the occurrence of unusual outbreaks than as presenting exact and complete records of the actual numbers of cases and the extent of epidemics. This is especially true as regards reports of disease in Russia and the central countries of Europe and in the zones of military activity in the Orient.

## CHOLERA.

## EUROPE.

In Europe cholera was reported present in Austria-Hungary, Russia, Sweden, and Switzerland.

*Russia.*—In May, 1918, cholera was reported at Tashkentnine and Tzaritzin, and on July 7, 1918, at Petrograd.

*Sweden.*—At Stockholm 5 cases of cholera, stated to have originated on a vessel from Petrograd, were notified July 15, 1918.

*Switzerland.*—Cholera infection was declared present in Switzerland July 26, 1918.



## ASIA.

In continental Asia cholera was reported in China, India, Indo-China, Japan, Palestine, Persia, Siam, Straits Settlements, and Turkey in Asia. The disease was reported in the island of Java and the Philippine Islands.

*China.*—In November and December, 1917, 3 cases of cholera were notified at Antung, in the Province of Manchuria.

*India.*—Reports of the occurrence of cholera were received from the cities of Bombay, Calcutta, Karachi, and Madras, and from cities in the Province of Burma. At Bombay from July 8 to December 15, 1917, 58 cases were notified, and from December 30, 1917, to March 9, 1918, 219 cases; at Calcutta, July 1 to December 15, 1917, 203 fatal cases were notified, and from December 30, 1917, to April 20, 1918, 437 fatal cases; at Karachi, September 9 to December 15, 1917, 12 cases were notified, and from December 30, 1917, to February 23, 1918, 25 cases; at Madras, July 1 to December 1, 1917, 117 cases were notified, and from December 30, 1917, to April 6, 1918, 50 cases. In the Province of Burma cholera was present at Mandalay, July 29 to August 25, 1917, with 2 cases; at Pegu, July 1 to 7, 1917, with 7 cases; at Prome, July 29 to August 11, 1917, with 1 case; and at Rangoon, July 8 to September 8, 1917, with 10 cases, and December 30, 1917, to May 4, 1918, with 34 cases.

*Indo-China.*—During the period July 1 to December 31, 1917, 1,018 cases of cholera were notified in Indo-China. The cases were distributed according to Provisions as follows: Anam, 246; Cambodia, 167; Cochin-China, 592; Kwang-Chow-Wan, 10; Tonkin, 3. During the two months ended February 28, 1918, 190 cases were notified. Of these, 135 occurred in Cambodia, 54 in Cochin-China, and 1 in Tonkin. A prison outbreak of cholera which was reported at Pnompenh, in Cambodia, as present in October and November, 1917, was declared nonexistent in December, 1917.

*Japan.*—Cholera was reported present in Japan in September, 1917, with 252 cases occurring in five Provinces and districts. Two cases were notified at Tokyo.

*Palestine.*—During the period from December 28, 1917, to March 22, 1918, 133 cases were reported in Palestine, occurring in the area of military occupation. Of these, 65 were reported at Deir Seneid, 24 at Sukkarieh, 4 at Jaffa, and 1 each at Ludd and Jerusalem. The remaining cases were reported mainly from military camps and stations.

*Persia.*—During the months of July, August, and September, 1917, cholera was present in Persia, with about 600 reported cases. The area of prevalence was mainly on the Caspian littoral, in the Provinces of Asterabad and Mazanderan. In October and November, 1917, 78 cases, occurring in seven localities, were reported in the Province of Khorasan. In the territory of Seistan, which extends into Afghanistan, 6 cases were notified in November, 1917. On April 22, 1918, cholera was reported at Bendir Bouchir, on the Persian Gulf.

*Siam.*—At Bangkok cholera was present in September, 1917.

*Straits Settlements.*—Two cases were notified at Singapore in September and October, 1917.

*Turkey in Asia.*—From November 1 to 15, 1917, 40 fatal cases of cholera were notified at Bagdad.

## INSULAR.

*Java.*—In East Java 4 cases of cholera were reported from July to November, 1917; in mid-Java, July to October, 1917, 2 cases; in west Java, from July to December, 1917, 703 cases, of which 127 were notified in the city of Batavia. An increase in cholera prevalence in Java was noted in the spring of 1918. In mid-Java, from April 26 to May 29, 1918, 487 cases were reported, and in west Java, from April 19 to May 23, 1918, 792 cases, of which 126 occurred at the city of Batavia. During the first week in June, 1918, 63 cases were reported in mid-Java, and in west Java 263 cases, of which 137 occurred at Cheribon, a city situated about 150 miles from Batavia. Cholera was reported present at Cheribon May 6, and continued present during the month. On July 24, 1918, cholera was reported present at Samarang and Surabaya.

*Philippine Islands.*—During the period from July 1 to December 29, 1917, 7,649 cases of cholera were notified in the Philippine Islands. From December 30, 1917, to June 29, 1918, there were notified 2,491 cases. At Manila 1 case of cholera was notified January 12, 1918.

*On vessel.*—An outbreak of cholera on the steamship *Angermanland* from Petrograd, Russia, was reported at Stockholm, Sweden, July 14, 1918. A total of 8 cases was reported.

## PLAGUE.

## EUROPE.

In Europe plague was reported only in Great Britain.

*Great Britain.*—At Gravesend, England, 3 cases of plague were reported in August, 1917, in persons arrived on the steamship *Matiana*. On May 19, 1918, 3 cases of plague arrived at Gravesend on the steamship *Somali*, from Bombay, and on June 2, 1918, a further case developed at Rochester, England, in a member of the crew of the *Somali*. On June 19, 1918, a fatal case of plague was notified at Erwardon, in the rural district of Samford, East Suffolk, England.

## ASIA.

In continental Asia plague was reported present in Arabia, Ceylon, China, India, Indo-China, Siam, the Straits Settlements, and Turkey in Asia. The disease was also present on the island of Java, Dutch East Indies.

*Arabia.*—At Aden plague was reported present July 4, 1917.

*Ceylon.*—At Colombo from July 6 to December 1, 1917, 22 cases of plague were reported, and from December 30, 1917, to March 3, 1918, 37 cases.

*China.*—Plague was reported at Amoy with 6 cases during the first week in July, 1917, and present in the vicinity of Amoy in March, 1918. At Hongkong 4 cases were notified in July and August, 1917, and from April 14 to May 25, 1918, 25 cases. Pneumonic plague was reported present in north China in January, 1918. In

February, 1918, plague was reported in Anhwei Province, with 9 fatal cases occurring at Fengyanghsien and 1 case at Pengpu; in Chili Province plague was reported present in the vicinity of Kalgan, February, 1918, and in Shansi Province during the same month, with an estimated number of 116 cases. In March, 1918, plague was reported at Nanking.

*India.*—During the period from July 1 to December 29, 1917, 280,258 cases of plague were notified in India, and from December 30, 1917, to April 13, 1918, 472,270 cases. Occurrence of plague in cities was reported as follows: Bombay, July 1 to December 29, 1917, 579 cases; December 30, 1917, to April 20, 1918, 768 cases; Calcutta, 6 cases occurring from July 15 to September 29, 1917, and 34 cases occurring from December 30, 1917, to April 20, 1918; Karachi, 76 cases from July 1 to December 29, 1917, and from December 30, 1917, to April 6, 1918, 261 cases; Madras, 1 case occurring during the first week in October, 1917, and in February and March, 1918, 3 cases. In the Province of Burma plague was reported in the cities of Bassein, Henzada, Mandalay, Moulmein, Myingyan, Pegu, Prome, and Toungoo, with about 259 fatal cases occurring during the period from July 1, to December 29, 1917, and from December 30, 1917, to April 27, 1918, with 4,447 fatal cases. In the city of Rangoon, Burma, 605 cases were notified from July 1 to October 20, 1917; from October 21 to December 22, 1917, 56 fatal cases; and from December 30, 1917, to May 4, 1918, 1,104 cases.

*Indo-China.*—During the period from July 1 to December 31, 1917, 290 cases were reported in Indo-China, and from January 1 to February 28, 1918, 275 cases. The cases were distributed in the Provinces of Anam, Cambodia, Cochin-China, Laos, and Tonkin.

*Siam.*—At Bangkok, from July 3 to October 27, 1917, 31 cases of plague were notified, and from January 13 to March 2, 1918, 24 cases.

*Straits Settlements.*—At Singapore, from July 1 to October 6, 1917, 10 cases of plague were notified, and from January 6 to February 16, 1918, 29 cases.

*Turkey in Asia.*—Plague was reported present at Trebizond in the month of December, 1917.

#### INSULAR.

*Java.*—In the island of Java, Dutch East Indies, plague was reported present in July, 1917, from October to December, with 196 cases, and in 1918, from January 1 to April 8, with 174 cases. The cases were distributed in the districts of Djocjakarta, Kediri, Madioen, Samarang, Surabaya, and Surakarta, situated in east Java. In west Java, from November to December, 1917, there were notified 45 cases; in January, 1918, 106 cases.

#### AFRICA.

Plague was reported present in Africa, in British East Africa, British Gold Coast, Egypt, Senegal, and the Union of South Africa.

*British East Africa.*—At Mombasa 31 cases of plague were reported from October 1 to December 31, 1917.

*British Gold Coast.*—At Axim plague was reported present in January, 1918.

*Egypt.*—In Egypt plague was reported present in the Province of Minieh from July 29 to September 11, 1917, with 9 cases; at Alexandria, July 31 to October 15, 1917, with 7 cases; at Cairo, December 17 to 23, 1917, with 2 cases; at Port Said, from July to December, 1917, with 14 cases; at Suez, July 2 to October 20, 1917, with 62 cases. On December 31, 1917, 2 cases were reported remaining in Egypt. From January 1 to June 20, 1918, 203 cases were reported. Of these, 192 cases were distributed in the Provinces of Beni-Souef (6), Fayoum (28), Girgeh (28), Kenh (2), Minieh (128). The remaining cases occurred in cities as follows: Alexandria, 3 cases in January; Port Said, 7 cases in January; Kantara, 1 case in March.

*Senegal.*—Plague was reported present in the interior of Senegal in September, 1917, and on February 2, 1918, at St. Louis, the capital of French Senegal and the terminus of caravan routes from the Sahara.

*Union of South Africa.*—In the Cape of Good Hope State plague was reported present in the Glen Grey district, at Cradock, late in August, 1917.

#### SOUTH AMERICA.

In South America plague was reported in Argentina, Brazil, Ecuador, and Peru.

*Argentina.*—At Buenos Aires, 16 cases of plague were reported in April and May, 1918. The first 3 cases were observed in handlers of cargo arrived on a vessel from Japan; the remaining cases occurred in various localities in the city of Buenos Aires. At Tucuman 3 cases of plague occurred in an institution, March, 1918.

*Brazil.*—At Bahia plague was present from July 8 to December 15, 1917, with 12 cases and from December 30, 1917, to February 23, 1918, with 4 cases; at Pernambuco, July and September, 1917, with 6 cases; and at Rio de Janeiro in December, 1917, with 1 case, and in January, 1918, with 1 case.

*Ecuador.*—At Guayaquil, from July 1 to November 30, 1917, 72 cases of plague were reported. About January 15, 1918, an outbreak of plague occurred at Guayaquil. In February, 1918, 66 cases were reported; from March 16 to 31, 7 cases; during the month of April, 21 cases; from May 16 to 31, 5 cases; and during the month of June, 2 cases. At other localities in Ecuador the occurrence of plague was reported as follows: Babahoyo, 1 case in February, 1918; Duran, from February 1 to March 30, 1918, 2 cases, and in April, 1918, 2 cases.

*Peru.*—During the period from July 1 to December 31, 1917, 169 cases of plague were reported in Peru. The cases were distributed according to departments as follows: Ancachs, 2 cases; Arequipa, 2 cases; Callao, 10 cases; Lambayeque, 11 cases; Libertad, 83 cases; Lima, 60 cases; Piura, 1 case. During the three months ended March 31, 1918, 7 cases of plague were reported in the department of Ancachs and 1 case each in the departments of Callao and Junin; in the department of Lambayeque, 32 cases notified at Chiclayo, Ferrenafe, Jayanca, and Lambayeque; in the department of Libertad, 140 cases occurring at Guadalupe, Mansiche, Pacasmayo, Salaverry, San José and San Pedro, and in the country district of Trujillo; in the department of Lima 31 cases occurring in the city of Lima and

the surrounding country; and in the department of Piura 1 case occurring at Catacaos. The area affected was confined to the coastal region of Peru with the exception of the department of Junin which is situated in the interior and wholly in the Andean region. From April 1 to 15, 1918, 23 cases of plague were notified in Peru as follows: Ancachs, 1 case; Lima, 1 case; Libertad, 16 cases; Piura, 5 cases.

## INSULAR.

*Hawaii*.—A case of plague was notified at Laupahoehoe.

## ON VESSELS.

*S. S. Matiana*.—The occurrence of 9 cases of plague was reported on the steamship *Matiana* en route for the port of London, from July 14 to 18, 1917.

*S. S. Quilpue*.—On May 9, 1918, 2 cases of plague were reported on the steamship *Quilpue* at Callao, Peru.

*S. S. Somali*.—The steamship *Somali* from Bombay arrived at Gravesend, England, May 19, 1918, with 3 cases of plague on board.

## RAT EXAMINATION AND PLAGUE IN RODENTS.

Rat examination was carried out from July 1, 1917, to June 30, 1918, but reports of the actual number of rats examined are available only for Hongkong and Shanghai, in China; for Liverpool in Great Britain; and for Hawaii and the Philippine Islands.

*China*.—At Hongkong from July 1 to December 29, 1917, 54,648 rats were examined, with 55 rats found plague-infected, and from December 30, 1917, to June 29, 1918, 54,463 rats were examined, with 120 rats found plague-infected. At Shanghai from July 1 to December 29, 1917, 6,196 rats were examined and from December 30, 1917, to June 1, 1918, 5,483 rats. No plague infection was found in these cases.

*Great Britain*.—At Liverpool from July 8 to December 15, 1917, 4,081 rats were examined and from December 30, 1917, to June 29, 1918, 5,287 rats. No infection was found.

*Hawaii*.—In the Territory of Hawaii rat examination continued to be carried out with an average of about 400 rats examined per week at Honolulu and about 2,000 at Hilo. At Paauhau on July 15, 1917, a plague rat was found; on August 15, 1917, 1 rat each at Kukaiau and Paauhau; at Kukaiau, 1 rat each was found on October 18, 19, and 21, 1917; on October 22, 1917, 1 rat was found at Paauhau; on February 2, 1918, 2 plague rats were found at Kukaiau; and on May 18, 1918, 1 rat was found at Laupahoehoe.

*Philippine Islands*.—From July 1 to December 31, 1917, 58,856 rats were examined at Manila, and from January 1 to May 31, 1918, 47,243 rats. No plague infection was found.

## TYPHUS FEVER.

## EUROPE.

In Europe typhus fever was reported present in Austria-Hungary, France, Germany, Great Britain, Greece, Italy, Portugal, Russia (including Lithuania and Poland), Spain, and Sweden.

*Austria-Hungary.*—In Austria, during the period from October 22 to December 17, 1917, 2,371 cases of typhus fever were reported, including 634 cases in Bohemia, 809 in Galicia, 617 in Moravia, and 243 in Styria. In Hungary from November 26, 1917, to January 20, 1918, 16 cases were reported, and from January 21 to February 24, 1918, 21 cases, of which 16 occurred in the city of Budapest.

*France.*—In December, 1917, a case of typhus fever was notified at Marseille.

*Germany.*—A statement of typhus-fever occurrence in Germany is to be considered rather as indicative of the presence of the disease than as a record of the extent of its prevalence. From July to December 22, 1917, about 55 cases were reported, and from December 23, 1917, to March 23, 1918, about 196 cases. The districts affected were Allenstein, Bromberg, Breslau, Gumbinnen, Königsberg, Mecklenburg-Schwerin, Marienwerder, Oppeln, Posen, and Wiesbaden. The disease was also present in Schwarzburg-Rudolstadt, and at Berlin, Frankfurt on the Main, Königsberg, and Potsdam. In Alsace-Lorraine 77 cases were reported from December 23, 1917, to February 2, 1918, of which 59 occurred in workmen's camps at Pontigen and Werningen; at Metz 17 cases were reported. From April 14 to May 11, 1918, 54 cases were reported in Germany. In addition, 101 cases were reported as occurring among prisoners of war, of which 99 occurred in Königsberg and 1 in Oppeln. Three cases were reported among the repatriated from Volhynia, Russia.

*Great Britain.*—In Scotland 1 case of typhus was notified at Glasgow in October, 1917; in December, 1917, 1 case; and from January 20 to May 18, 1918, 22 cases. In England 1 case was notified at Manchester. In Ireland, from February 10 to May 11, 1918, there occurred 22 cases at Belfast, and at Dublin from March 24 to April 27, 1918, 4 cases.

*Greece.*—At Saloniki, from July 1 to December 29, 1917, 176 fatal cases of typhus were notified, and from December 30, 1917, to April 27, 1918, 48 fatal cases. At Arta 2 cases occurred in February, 1918; at Janina an epidemic of typhus was declared present January 27, 1918, with a total to February 14, 1918, of 110 cases.

*Italy.*—During the period from March 18 to April 7, 1918, 4 cases of typhus were notified at Bagnasco, Province of Cuneo, and from March 10 to 16, 1918, 2 cases at San Remo.

*Portugal.*—At Lisbon typhus was reported present in February, 1918, and from that date to March, 1918, 18 cases were reported. At Oporto, during the month of December, 1917, 23 cases were reported, and from January 1 to March 8, 1918, there was reported a total of 1,811 cases.

*Russia.*—At Archangel typhus was present from July 2 to September 14, 1917; at Moscow from July 2 to October 16, 1917, the disease was present, with 859 reported cases; at Petrograd, with 42 cases from July to November, 1917; at Riga, with 5 cases, from July 22 to 28, 1918. In Lithuania, from December 30, 1917, to March 2, 1918, 1,878 cases were reported. In Poland, from June 17 to December 8, 1917, 4,896 cases were reported occurring in regions occupied by invading forces, and from December 23, 1917, to March 9, 1918, the disease was present, with 8,403 reported cases. Occurrence in cities in Poland was reported as follows: At Lodz, the second city in population in Poland, 219 cases in November and December, 1917;

at Warsaw, from June 17 to December 8, 1917, 2,956 cases, and from February 10 to March 9, 1918, 2,747 cases. In Siberia, at Vladivostok, during the months of October and November, 1917, typhus was present, with 12 cases, and in the month of April, 1918, with 4 cases.

*Spain.*—At Almeria, Spain, typhus was reported present in April, 1918, with 1 case: in Coreubion and vicinity, in the Province of Coruna, from April 6 to 11, 1918, 11 cases were reported; at Madrid, during the month of October, 1917, 1 case was notified, and from January to March, 1918, 2 cases.

*Sweden.*—At Gottenborg 3 cases of typhus were notified during the months of October, November, and December, 1917.

## ASIA.

In Asia typhus fever was reported present in China, Chosen (Korea), and Japan.

*China.*—At Antung, from July to December, 1917, 44 cases of typhus were notified; at Changsha, in May, 1918, 2 cases; at Hankow, in July, 1917, 1 case was notified, and in April, 1918, 2 fatal cases were reported in Europeans. On the line of the Chinese Eastern Railway there occurred at Harbin, from January 1 to June 16, 1918, 20 cases; at Manchuria Station, January 15 to June 30, 1918, 27 cases; at Pogranitchnaya, May 20 to June 6, 1918, 4 cases. At Shanghai a fatal case was notified during the first week in May, 1918; at Tientsin, in November, 1917, 1 case was notified; at Tsingtau, from August to November, 1917, there were notified 3 cases.

*Chosen (Korea).*—One case of typhus was notified at Seoul, the capital city, in November, 1917, and from February 1 to April 30, 1918, 9 cases were notified.

*Japan.*—Typhus was present at Hakodate in July, 1917; at Nagasaki, from July to December, 1917, 53 cases were notified, and from January 7 to May 19, 1918, 22 cases.

## AFRICA.

In Africa typhus fever was reported present in Algeria, Egypt, Tunisia, and the Union of South Africa.

*Algeria.*—Three cases were notified at Algiers from July 1 to December 31, 1917.

*Egypt.*—At Alexandria the reported prevalence from July 17 to December 28, 1917, was 521 cases, and from January 8 to May 4, 1918, 1,826 cases; at Cairo, from July to December, 1917, 143 cases; at Port Said, from July to November, 1917, 6 cases.

*Tunisia.*—Occurrence of typhus in Tunisia was reported as follows: Tunis, 1 case notified during the first week in July, 1917, 1 case early in December, 1917, and from February 9 to May 17, 1918, 48 cases, of which 28 occurred in a prison outbreak of the disease. At Tala and Tozer, interior regions of Tunisia, epidemic typhus was reported during March, 1918.

*Union of South Africa.*—On August 25, 1917, typhus fever was reported present in the State of Cape of Good Hope, 16 localities being reported infected. From September 10, 1917, to April 7, 1918,

1,501 cases were notified. Of these, 34 cases occurred in Europeans; in Natal an outbreak was reported in December, 1917, and to April 7, 1918, 50 cases were notified, occurring in natives.

## AMERICA.

In North America typhus was reported present in Canada, Newfoundland, and Mexico.

*Canada.*—In December, 1917, 3 cases of typhus were notified at Kingston, Ontario, and 2 cases at Montreal.

*Newfoundland.*—At St. Johns 1 fatal case of typhus was reported during the first week in April, 1918.

*Mexico.*—From July 10 to December 15, 1917, 6 cases of typhus were notified at Aguascalientes; in August, 1917, 1 case was notified at Coatepec; in Durango State typhus was reported prevalent in epidemic form on ranches in the vicinity of El Rio in October, 1917, and at Guanacevi, in February, 1918, typhus was reported epidemic; at Guadalajara, in April, 1918, 2 cases were reported. In July there were notified at Jalapa 3 cases of typhus and at Orizaba 1 case; in Mexico City, from July 8 to December 29, 1917, 2,175 cases were reported and from December 30, 1917, to June 1, 1918, 892 cases. At Parral, State of Chihuahua, typhus was reported epidemic July 10, 1918.

In South America typhus was reported present in Argentina and Brazil.

*Argentina.*—At Buenos Aires 1 fatal case was notified in August, 1917, and at Rosario in December, 1917, 1 case, and April, 1918, 1 case.

*Brazil.*—At Rio de Janeiro from July 28 to December 1, 1917, 9 cases of typhus were notified, and during the last week in May, 1918, 1 case was notified.

## INSULAR.

*Canary Islands.*—At Santa Cruz de Tenerife 1 fatal case of typhus was reported in September, 1917.

## YELLOW FEVER.

Yellow fever was reported present in Central America, Mexico, and South America.

## CENTRAL AMERICA.

*Guatemala.*—On April 22, 1917, yellow fever was reported present at Retalhuleu, a locality situated about 25 miles from Champerico, a port on the Pacific coast of Guatemala. On May 23, 1918, the disease was reported still present at Retalhuleu and to be spreading along the Pacific coast. On August 19, 1918, yellow fever was reported still present on the Pacific coast of Guatemala.

*Honduras.*—At Tegucigalpa 1 fatal case of yellow fever was reported in December, 1917.

## MEXICO.

On the Gulf coast of Mexico yellow fever was reported in the State of Campeche, at Campeche, September 25, 1917, with 2 cases;



in the State of Yucatan, at Merida, September 1 to October 28, 1917, with 3 cases; and at Peto, July 29 to August 11, 1917, with 6 cases. Yellow fever was again reported present at Merida on April 18, 1918, with 1 case. On the Pacific coast, at Acapulco, a case was reported on June 16, 1918, and on August 24, 1918 the outbreak was declared to be at an end.

## SOUTH AMERICA.

In South America yellow fever was reported in Brazil, Ecuador, and Venezuela.

*Brazil*.—At Bahia from March 10 to May 11, 1918, 2 cases were notified.

*Ecuador*.—In Ecuador yellow fever was reported as follows: Babahoyo, during the two weeks ended February 5, 1918, 1 case; Chobo, in March, 1918, 1 case; Guayaquil, 29 cases from July 1 to November 30, 1917; from February 1 to March 31, 1918, 13 cases, and from May 16 to June 15, 1918, 37 cases; Milagro, February 1 to 15, 1918, 1 case; Naranjal, April 1 to 30, 1918, 1 case; Naranjito, July and August, 1918, 2 cases; Yaguachi, November 1–30, 1917, 1 case.

*Venezuela*.—From the last week in July to November 7, 1917, 10 cases of yellow fever were reported at Coro, Venezuela.

## MARINE HOSPITALS AND RELIEF.

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### RELIEF STATIONS.

During the fiscal year ended June 30, 1918, the service operated 20 marine hospitals, all of which are owned by the Government, and maintained 119 other relief stations where hospital and out-patient relief was furnished patients. In addition, the service maintained a sanatorium at Fort Stanton, N. Mex., for the care and treatment of patients suffering from tuberculosis. During the year arrangements were made whereby war-risk insurance patients are now treated at marine hospitals and other relief stations of the service.

### RELIEF TO SEAMEN AND OTHER PATIENTS.

There were 71,806 patients treated at the various marine hospitals and relief stations of the service during the year, including the patients treated at the tuberculosis sanatorium at Fort Stanton, N. Mex. This number also includes patients treated by local physicians (92 in number) who were appointed to furnish professional services during the year to members of certain coast-guard stations. Of the above-mentioned number 20,609 patients were treated in hospitals a total of 534,991 days, and 53,599 patients were treated at dispensaries a total of 96,064 times. In addition to the foregoing, medical officers detailed for duty on board various vessels of the Coast Guard furnished a great deal of medical relief both to beneficiaries of the service and to the natives of Alaska.

### PHYSICAL EXAMINATIONS.

The medical officers of the service made 32,540 physical examinations of candidates for various positions during the year, as noted under the special headings given below:

*United States Coast Guard.*—Seven thousand one hundred and eleven applicants were examined, of whom 3,470 were rejected.

*Post office department.*—One thousand three hundred and sixty applicants were examined, of whom 315 were rejected.

*Coast and Geodetic Survey.*—One hundred and eighty-five applicants were examined, of whom 30 were rejected.

*Lighthouse Service.*—One hundred and seventy-one applicants were examined, of whom 20 were rejected.

*Civil Service Commission.*—Two thousand and fifty-five applicants were examined, of whom 147 were rejected.

*Philippine Islands.*—Fifteen applicants were examined and passed.

*Alaska Engineering Commission.*—Two hundred and sixty-five applicants were examined, of whom 32 were rejected.

*United States Navy.*—Four hundred and forty-eight applicants were examined, of whom 122 were rejected.

*United States Army.*—One hundred and six applicants were examined, of whom 1 was rejected.

*Bureau of Education.*—Twelve applicants were examined and passed.

*Steamboat-Inspection Service.*—Nine thousand three hundred applicants were examined, of whom 305 were rejected.

*Merchant seamen of the United States.*—Eight thousand two hundred and sixty-four American seamen were examined, of which number 873 were rejected.

*Foreign seamen.*—One thousand nine hundred and seventy-nine foreign seamen were examined for service, of whom 175 were rejected.

*United States Employees' Compensation Commission.*—One hundred and eighty-four persons were examined on account of the United States Employees' Compensation Commission, of whom 12 were rejected.

*Bureau of War Risk Insurance.*—Fifteen persons were examined on account of the Bureau of War Risk Insurance, of whom 4 were rejected.

*United States Shipping Board.*—One thousand and sixty-two applicants were examined, of whom 79 were rejected.

#### PURVEYING DEPOT.

The following statistics show the transactions of the purveying depot during the fiscal year:

##### *Supplies purchased.*

Alcohol and wines	\$1, 160. 46
Beds and bedding	9, 152. 97
Bottles	830. 64
Combination chart files and desks	240. 00
Chart files	1, 157. 00
Cleaning material	54. 68
Cotton, gauze, bandages, muslin, crinoline, etc.	18, 072. 27
Corks	50. 43
Drugs and chemicals	24, 115. 63
Dry goods	4, 131. 24
Electric lamps	68. 37
Furniture	494. 05
Flags	1, 056. 05
Floor sweeps (hair and cotton)	420. 01
Food and dish wagons	288. 00
Floor scrubbing and polishing machines	520. 00
Garden and lawn implements	2, 323. 55
Hardware	237. 25
Hospital suits	2, 465. 70
Indelible ink	126. 00
Journals and books	898. 91
Kitchen and dining room supplies and equipment	8, 938. 38
Ligatures (silk and catgut)	1, 033. 98
Laboratory supplies	247. 87
Miscellaneous supplies	962. 41
Night shirts	1, 487. 50
Office supplies	1, 740. 09
Packing material	796. 77
Plasters	1, 106. 78
Rubber goods	1, 108. 25
Surgical instruments and appliances	11, 996. 56

Subsistence supplies .....	\$75. 84
Sterilizing outfits .....	2, 299. 99
Steel lockers .....	918. 00
Slippers .....	1, 638. 00
Thermometers, clinical .....	763. 20
Window shades .....	178. 53
X-ray plates .....	1, 360. 69
X-ray equipment .....	473. 73
Total .....	104, 989. 78

*Credit.*

## By bills paid direct from funds:

Care of seamen, etc .....	\$1, 111. 69
Maintenance of marine hospitals .....	21, 322. 86
Furniture .....	494. 05
Special studies of pellagra .....	131. 24
Interstate quarantine service .....	9. 19
Quarantine service .....	61. 06
Preventing spread of epidemic diseases .....	231. 26
Protecting health of the military forces .....	5, 000. 00
Immigration service .....	15. 49
	<hr/>
	28, 376. 84
	<hr/>
	76, 612. 94

## By transfer of funds to the credit of purveying depot supplies, Public Health Service, on account of articles furnished from stock:

Quarantine service .....	1, 764. 98
Interstate quarantine service .....	982. 05
Preventing spread of epidemic diseases .....	870. 69
Special studies of pellagra .....	511. 91
Studies of rural sanitation .....	11. 22
Field investigations of public health .....	28. 20
Protecting health of the military forces .....	346. 72
United States Coast Guard .....	286. 96
United States Army .....	2, 402. 50
Treasury Department, contingent expenses .....	21. 18
Bureau of War-Risk Insurance .....	129. 10
Department of Labor, interment camp .....	4. 50
	<hr/>
	7, 360. 01

Net expenditures chargeable to the appropriation for purveying depot supplies, Public Health Service, 1918 (in amount \$70,000) .....

69, 252. 93

## Operating expenses:

Salaries .....	\$7, 578. 21
Equipment (furniture, etc) .....	196. 24
Cartage of supplies .....	216. 98
Removal of ashes and rubbish .....	24. 00
	<hr/>
	8, 015. 43

Total net expenditures .....

77, 268. 36

Cost of supplies ordered shipped direct to stations from contractors, as included above .....

27, 044. 85

## TUBERCULOSIS SANATORIUM AT FORT STANTON, N. MEX.

REPORT FOR THE YEAR ENDED JUNE 30, 1918, BY F. H. M'KEON, SURGEON.

*General information.*

Number of patients present July 1, 1917 .....	218
Number of patients admitted during the year .....	<sup>1</sup> 154
	<hr/>
Total number treated during the year .....	372

<sup>1</sup> Thirty-two beneficiaries of Bureau of War-Risk Insurance included.

Number of patients discharged during the year.....	136
Number of deaths (included in the preceding item).....	54
Number of bodies interred in sanatorium cemetery.....	50
Number of patients present June 30, 1918.....	236
Maximum number of patients during the year.....	236
Minimum number of patients during the year.....	211
Total number of days' treatment furnished patients.....	80, 385
Number of officers and attendants.....	92
Number of patients who left against advice.....	32
Number of patients who deserted.....	1
Number of patients discharged for causes affecting discipline.....	2
Number of patients transferred to other stations.....	1
Number of physical examinations during the year.....	1, 169
Number of patients who returned at their own expense.....	23
Number of patients retransferred.....	5
Total number readmitted.....	28

Average duration of stay of patients discharged, 1 year 8 months 2 days.

Minimum stay, 6 days.

Maximum stay, 15 years 2 months 28 days.

*Patients discharged during the year, with stage of disease and result of treatment.*

	Appar- ently cured.	Ar- rested.	Im. proved.	Not im- proved.	Quies- cent.	Died.	Total.
Incipient.....	5				1		6
Moderately advanced.....	1	10	4	1	7	2	25
Far advanced.....	1	10	20	15	7	51	104
Not examined.....						1	1
Total.....	7	20	24	16	15	54	136
Average stay in days.....	193	592	568	440	704	713	

Seventy-eight and three-tenths per cent of the cases were far advanced when received. Of the 54 who died, 16 remained over 2 years, 12 between 1 and 2 years, 10 between 6 and 12 months, 5 between 3 and 6 months, and 11 less than 6 months. Seven necropsies were performed.

*Prognosis on arrival.*

Favorable for apparent cure.....	2
Favorable for arrest.....	48
Favorable.....	8
Favorable for prolongation of life by living under proper conditions.....	57
Doubtful.....	3
Unfavorable.....	14
Grave.....	1
No prognosis.....	2
Not examined.....	1
Total.....	136

CAUSES OF DEATH.

Of the 54 deaths which occurred during the year 3 were due to massive hemorrhage from the lungs, 1 to hemorrhage from the renal artery, 1 to septic pneumonia, 2 to tuberculous meningitis, 1 to chronic empyema, 2 to parenchymatous nephritis, 1 to chronic interstitial

nephritis, 3 to tuberculous laryngitis, 1 to acute dilatation of the heart, and 1 to suicide. It will be understood that all the special cases of death mentioned above occurred in cases which were complicated by advanced pulmonary tuberculosis. Thirty-eight deaths were registered as being caused by tuberculosis of the lungs, uncomplicated.

#### TREATMENT.

Only well-recognized and approved methods of treatment were employed during the fiscal year. While there has been an expressed desire on the part of certain patients for special treatments which have been exploited in either the medical or the lay press, it has been felt that new methods of treatment should not be adopted until their worth has been proven. However, in view of the apparent good results that have been obtained from heliotherapy in the treatment of tuberculous infections, it is probable that selected cases will be given this form of treatment during the coming year. Treatment by therapeutic pneumothorax has been continued with satisfactory results. The total number of treatments for the year was 232.

During the greater part of the year there has not been a dentist detailed for duty here; consequently the number of dental treatments have been relatively small. They numbered in all 108 and included extractions, fillings, or oral surgery, etc.

Eye, ear, nose, and throat treatments numbered 2,156.

Fifty-two surgical operations were performed.

The practice of using graduated exercise in those cases in which it was indicated has been continued. The exercises employed have been, as in the past, mainly the policing of grounds and buildings, in addition to such amount of walking as seemed desirable. The patients on exercise who performed useful detail work put in a total of 4,438 hours of labor. In addition, 150 hours of walking exercises were performed. The total number of patients on exercise during the year was 63. As heretofore, a number of patients have been privately employed, and their earnings for the year amounted to \$5,800.57. The total number of hours that these patients were engaged in such occupations was 31,343. Other patients who were given Government employment earned \$12,516.40. Patients who had been discharged as cured but retained as attendants earned \$3,307.34.

Owing to the shortage of medical officers occasioned by the war, no effort has been made to undertake original laboratory investigations. It is greatly to be regretted that the wealth of material at Fort Stanton is not utilized for this purpose, but it is hoped that later on arrangements may be made to inaugurate investigatory work. One thousand one hundred and forty-eight examinations of sputum were made and 472 urinalyses performed. Sera for the Wassermann test has been forwarded to the hygienic laboratory at Washington whenever patients presented indications of syphilitic infection. While only a comparatively small percentage of patients have a luetic complication as shown by the Wassermann test, it has been found that antisymphilitic treatment along recognized lines resulted in quite a marked improvement in those patients who give a history of having had syphilis.

## AMUSEMENTS.

The amusements provided for patients during the past year have consisted principally of motion-picture performances. As has been the case in former years, these entertainments have been given under the auspices of the amusement association. Not only the regular weekly-performance has been given, but 10 special so-called feature films have been shown. One of the special entertainments was produced for the benefit of the American Red Cross, the amusement association charging an admission fee and turning over the entire proceeds to the Red Cross. This form of entertainment appeals to the patients, as is shown by the fact that the average attendance for the year has been 175. This and other amusements are provided without expense to the Government, the necessary costs being taken care of from voluntary subscriptions received from officers and attendants. The club, which was organized during the fiscal year 1917 by patients under treatment here, has continued in operation and in the main has carried out the purposes for which it was organized. This organization has given three entertainments in the nature of vaudeville for the benefit of the American Red Cross. A small building has been set aside for the use of the club, in which building there is provision for pool playing and other light amusement. The club is financially solvent, despite the fact that they have donated about \$600 to the American Red Cross during the year. It may be said, in passing, that these donations represent only one of the many evidences of patriotism shown by patients and attendants at Fort Stanton. Permission will be asked to allow the organization to erect an extension to the building above referred to, the extension to be built without cost to the Government.

## ECONOMIES.

Thirty-seven and one-half gallons of liquid soap and 1,950 gallons of soft soap were made and used, waste tallow being generally used in the making. Twenty-one gallons of flavoring extracts for use in the kitchens and bake shops were made in the dispensary, which department also made 50 pounds of baking powder for station use.

The practice of using powdered and solid extracts of drugs in stock to make up tinctures and other preparations has been continued.

The station force has manufactured such hospital pajamas, sheets, pillow cases, and kitchen aprons as were required.

## COST OF MAINTENANCE.

The net cost per day per patient during the fiscal year ended June 30, 1918, was \$2.1172. This cost is considerably above that of the previous year, the increase being accounted for by the higher price of all commodities purchased.

The figure given above is based on all items of expenditures, not considering reimbursements from officer and attendants who purchased subsistence supplies (\$3,715.41) and receipts from sales of beef hides, grain sacks, cows, and bulls (\$10,553.57). If these reimbursements be considered the cost per patient per day would be \$1.9397.

While it is probable that the cost per day per man will be lessened during the coming fiscal year, the total expenditures will be enor-

mously increased by reason of the influx of patients who are being sent to Fort Stanton by the Bureau of War-Risk Insurance. The facilities of the station as they exist at present are greatly over-taxed, and it will be necessary to construct new buildings at an early date. Recommendations along these lines have already been made.

The concrete reservoir which was completed during the fiscal year 1917, is not being used because of the failure of the El Paso & South-western Railroad system to install a pipe line which to is supply sufficient water for the needs of the sanatorium. The water situation at the time that this is written is critical, owing to a stoppage of the inflow into the shallow well on the north side of the Bonito River. Recent rains have brought down a sufficient quantity of silt to close the feeding channels. We find ourselves, therefore, in the rather anomalous position of having a good flow of water in the river, without sufficient water in the wells to keep the north (old) reservoir full. There is being constructed with station labor and material a pipe line which will feed direct from the river into the shallow well.

#### LIBRARY.

There is maintained at Fort Stanton for the benefit of officers, patients, and attendants a circulating library, without expense to the Government. On June 30, 1918, there were 3,418 bound volumes, comprising 2,629 books of fiction and 789 books on miscellaneous subjects, including religious, travel, historical, and educational works.

From private funds contributed at this station, 20 monthly and 6 weekly magazines and periodicals were subscribed for. Subscriptions to 6 monthly and weekly magazines were donated.

As will readily be understood, the circulating library has given a considerable amount of healthy recreation and instruction to patients at this station. The magazines above referred to include a number of magazines devoted to tuberculosis work and the information contained in these publications has had a salutary effect in impressing upon the patients the necessity of following the strict régime of the sanatorium.

It is to be regretted that the Government has never seen fit to contribute in any way to the support of the library.

#### FARM AND HERD.

The conditions under which the farm and herd were operated during the past year have been unusually unfortunate. It has been the third season during which the rainfall has dropped to less than 50 per cent below normal. Despite that fact, the range, considered as a beef producer, has shown a profit. All other departments, including the piggery, the farm, and the poultry garden, have registered a loss. It is proposed to discontinue the station garden and the raising of poultry, with the incident production of eggs, during the coming year.

In considering the loss sustained in the production of pork, it may be said that no consideration has been given to the marked increase in the herd. A recommendation has been made that not less than 400 and not more than 500 of the 1,200 hogs on hand be sold. The proceeds of this sale will not be credited to the station, but the Government will profit thereby.



The total number of horses and mules on hand June 30 was 75. There were on hand on the same date 1,699 range cattle, of which approximately 500 were being pastured on the Mescalero Indian Reservation by contract because of the unusual poor range conditions which obtained at Fort Stanton during the past fiscal year. There have been 216 steers and cows butchered to produce beef for the use of patients, officers, and attendants.

Owing to a decision of the bureau which permits the employment of two clerks, who will have charge, under this office, of all matters pertaining to the sanatorium proper, it is believed that the range, farm, and dairy will show a profit during the coming year.

Owing to an omission made above, no mention has been made of the dairy. There were on hand July 1, 1918, 186 dairy cattle, including 3 bulls, 103 cows, 72 heifers, 5 heifer calves, and 3 bull calves. This dairy herd has produced during the fiscal year just ended a sufficient quantity of milk for the needs of the sanatorium. It is probable that an additional number of cows and bulls will have to be purchased in the near future to care for an increased number of patients.

*Items of expenditure.*

Item.	Per annum.	Per patient per day.
<b>Salaries:</b>		
Medical officers and pharmacist.....	\$8,632.24	\$0.1074
Office force.....	5,247.33	.0653
Power plant.....	2,997.50	.0373
Mechanics.....	3,028.67	.0377
Nurses and orderlies.....	4,092.00	.0509
Cooks and waiters.....	6,566.98	.0817
Laundry.....	1,452.00	.0181
Dairy.....	2,164.14	.0269
General.....	3,801.68	.0473
Range.....	1,097.08	.0136
Farm.....	6,219.40	.0773
<b>Total.....</b>	<b>45,299.02</b>	<b>.5635</b>
<b>Materials and supplies:</b>		
Subsistence supplies.....	38,802.44	.4828
Dispensary and laboratory.....	46.86	.0006
Table and kitchen ware.....	899.14	.0100
Laundry supplies.....	2,280.37	.0284
Fuel, wood, coal.....	21,205.82	.2638
Furniture.....	193.31	.0024
Power plant.....	1,070.92	.0128
Freight and transportation.....	2,287.25	.0284
Mechanical equipment for public buildings.....	5,077.48	.0632
Mechanical equipment for public buildings (suspense).....	1,400.00	.0174
Repairs and preservation of public buildings.....	6,539.67	.0813
Building material—maintenance.....	426.19	.0053
Carpenter's, plumber's, and painter's tools.....	360.68	.0045
Dairy supplies.....	132.40	.0016
Forage.....	37,002.14	.4605
Range supplies.....	989.33	.0123
Farm.....	2,656.24	.0368
Burial of seamen.....	308.40	.0038
Miscellaneous.....	2,341.43	.0291
Supplies from purveying depot.....	703.73	.0087
<b>Total.....</b>	<b>124,894.30</b>	<b>1.5537</b>
<b>Total expenditure.....</b>	<b>170,193.32</b>	<b>2.1172</b>
Reimbursements from officers and others for subsistence supplies.....	\$3,715.41	
Receipts from sale of—		
Hides.....	1,565.47	
Military sacks.....	245.84	
Cows.....	7,449.26	
Bulls.....	1,233.00	
	14,268.98	.1775
<b>Net expenditure.....</b>	<b>155,924.34</b>	<b>1.9397</b>

## DIVISION OF PERSONNEL AND ACCOUNTS.

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Although the Executive order of April 3, 1917, made the Public Health Service a part of the military forces of the United States and authorized the detail of officers for duty either with the Army or the Navy at the request of the respective secretaries, the Selective Service Regulations classed only those actually so detailed as performing military duty and exempt from the provisions of the draft law. As this made an apparent discrimination against commissioned medical officers not detailed to the military branches, the matter was presented to the Provost Marshal General for the further interpretation of the Executive order and a ruling was made by which the provisions of that order were extended to include in the military and naval forces of the United States all officers of the service, commissioned in accordance with authority of January 4, 1889.

The 13 officers who were detailed for duty with the Navy in the preceding year have been continued on that duty, and they have rendered valuable service as sanitary advisers in the naval districts to which they have been assigned. Two commissioned medical officers are now on duty with the Army and are utilized as sanitary advisers.

Owing to the exigency of the service and the urgent need for the trained personnel of the corps for the direction of important activities, it became necessary to request the detachment of 10 officers serving on coast-guard cutters so that only three commissioned officers now remain in that duty.

The marked extension of the activities of the service, especially in extra cantonment sanitation, the more active prosecution of industrial hygiene and the energetic measures taken for the prevention and control of venereal diseases, has required a large number of employees possessing medical and scientific training, and some difficulty has been experienced in securing and retaining adequate personnel to meet the obligations that have been imposed on the service. The extension of the age limits subject to the provisions of the draft has rendered it more difficult to secure sufficient noncommissioned personnel, as many of this class could receive commissions in the Army and prefer that, with the added benefit of being able to perform strictly military duty to the position offered by the service. However, on the whole, the added duties imposed on the service have been successfully met and in no other period in the life history of the service has so much public-health work been accomplished. Furthermore, there has been a marked increase in the beneficiaries of the service as a result of caring for patients incident to the pronounced increase in the merchant marine of the country and patients of the War Risk Insurance Bureau. Aid has also been extended to the Federal Board for Vocational Education, and this increase in

work has necessitated an enlarged personnel, which has been filled by the appointment of acting assistant surgeons.

Trained commissioned officers have been detailed as medical advisers in the following important bureaus:

Bureau of War Risk Insurance;  
United States Emergency Fleet Corporation, and the  
Federal Board for Vocational Education.

#### COMMISSIONED MEDICAL OFFICERS.

At the commencement of the fiscal year, July 1, 1917, the commissioned corps consisted of the Surgeon General, 1 Assistant Surgeon General at large, 14 senior surgeons, 70 surgeons, 44 passed assistant surgeons, and 82 assistant surgeons.

The changes during the fiscal year were as follows: Two surgeons were promoted to grade of senior surgeons to fill vacancies. Two passed assistant surgeons were promoted to the grade of surgeons, 20 assistant surgeons to the grade of passed assistant surgeons, and 5 candidates who passed the examination required by the laws and regulations of the service were commissioned assistant surgeons. On account of physical disability, 3 senior surgeons, 3 surgeons, and 2 passed assistant surgeons continued on waiting orders and 1 senior surgeon was placed on waiting orders.

At the close of the fiscal year, the commissioned Medical Corps consisted of the Surgeon General, 1 Assistant Surgeon General at large, 16 senior surgeons, 70 surgeons, 61 passed assistant surgeons, and 63 assistant surgeons. Two senior surgeons and 5 surgeons were upon detail in the bureau as assistant surgeons general, in accordance with the act approved July 1, 1902.

#### ASSIGNMENTS.

Among other assignments of commissioned medical officers during the fiscal year were the following: Twenty-one were assigned to exclusive immigration duty, their services being supplemented by employment of acting assistant surgeons; 4 to the quarantine service of the Philippine Islands; 13 to vessels of the Coast Guard; 23 to the quarantine stations in the continental United States, Porto Rico, and the Hawaiian Islands, 1 to duty in foreign countries to prevent the introduction of epidemic diseases into the United States.

#### SPECIAL DETAILS.

One commissioned medical officer continued on detail duty under the governor of the Panama Canal. Surg. John D. Long was continued as chief quarantine officer and director of health of the Philippine Islands.

#### FIELD INVESTIGATIONS OF PUBLIC HEALTH.

In accordance with the act of Congress approved August 14, 1912, authorizing the service to study and investigate the diseases of man, and conditions influencing the propagation and spread thereof—including sanitation and sewage, and the pollution either directly or

indirectly of the navigable streams and lakes of the United States—the following officers and corps of special assistants were detailed to make these special investigations.

### STUDIES OF RURAL SANITATION.

#### EXCRETA-BORNE DISEASES.

(Headquarters, U. S. Marine Hospital, St. Louis, Mo.)

Surg. L. L. LUMSDEN, in charge.  
Surg. L. P. H. BAHRENBURG, executive officer.

*Maysville, Ky.*

Field Agent J. S. LOCKE.  
Sanitary Insp. J. R. DEVINE.

*Muscle Shoals, Ala.*

Asst. Surg. H. S. MUSTARD.  
Asst. Epidemiologist W. K. SHARP.  
Sanitary Engineer W. G. STROMQUIST.  
Acting Asst. Surg. W. H. ABERNATHY.  
Acting Asst. Surg. H. S. CAPPS.  
Acting Asst. Surg. J. B. ELLIOTT.  
Acting Asst. Surg. W. B. ROBERTSON.  
Asst. Sanitary Engineer H. R. FULLERTON.  
Scientific Assistant S. R. MCKAY.  
Scientific Assistant H. B. LARNER.  
Sanitary Bacteriologist C. H. TAFT.

#### MALARIA.

(Headquarters, U. S. Marine Hospital, New Orleans, La.)

Asst. Surg. Gen. H. R. CARTER, in charge.  
Asst. Surg. R. C. DERIVAUX.  
Senior Sanitary Engineer J. A. A. LE PRINCE.  
Consultant H. I. EATON.  
Sanitary Engineer H. W. VAN HOVENBERG.  
Biologist M. B. MITZMAIN.  
Asst. Epidemiologist T. H. D. GRIFFITTS.  
Asst. Epidemiologist J. C. GEIGER.  
Special Expert W. C. PERDY.  
Special Investigator C. W. METZ.

#### ARSPHENAMINE.

Special Expert JULIUS STIEGLITZ.  
Pharmacologist M. I. SMITH.  
Special Expert D. E. JACKSON.  
Chemist R. Q. BREWSTER.  
Chemist JULIUS KAHN.

*Coastal waters.*

Passed Asst. Surg. F. A. CARMELIA, in charge.

#### INDUSTRIAL SANITATION.

(Headquarters, U. S. Marine Hospital, Pittsburgh, Pa.)

Passed Asst. Surg. A. J. LANZA, in charge.  
Consulting Physiologist F. S. LEE.  
Consulting Hygienist D. L. EDSALL.  
Consulting Hygienist R. G. PERKINS.  
Consulting Hygienist ALFRED STENGEL.  
Consulting Hygienist W. G. THOMPSON.  
Consulting Hygienist C. E. A. WINSLOW.  
Consultant C. D. SELBY.  
Consultant H. F. SMYTH.  
Physiological Chemist E. G. MARTIN.  
Physiological Chemist P. S. FLORENCE.  
Physiologist A. H. RYAN.  
Field Investigator M. D. SHIE.  
Field Investigator DAVID GREENBERG.  
Field Investigator P. M. HOLMES.  
Field Investigator JOS. HERZTEIN.  
Field Investigator L. W. KING.  
Field Investigator E. M. JOHNSON.

Field Investigator H. C. ANGERMYER.  
Field Investigator LEONARD GREENBURG.  
Field Investigator H. T. HARRISON.  
Field Investigator I. M. POCHAPIN.  
Field Investigator G. E. WRIGHT.  
Field Investigator ROY WELTER.  
Asst. Sanitary Chemist A. B. HASTINGS.  
Scientific Assistant G. H. JACOBSON.  
Scientific Assistant E. M. MARTIN.  
Scientific Assistant C. H. LARRABEE.  
Scientific Assistant C. M. STOWELL.  
Scientific Assistant M. M. WRIGHT.  
Scientific Assistant H. J. ZIEGLER.  
Scientific Assistant R. R. TINKLER.

#### T. N. T. POISONING.

Physiologist W. L. MENDENHALL.  
Physiologist C. W. HOOPER.  
Physiological Chemist ELIAS ELVOVE.  
Assistant Chemist E. J. CASSELMAN.  
Assistant Chemist J. K. MARCUS.

*Nitro. W. Va.*

Passed Asst. Surg. J. A. WATKINS, in charge.

Acting Asst. Surg. H. G. BIELER.  
Acting Asst. Surg. R. E. DAVIS.  
Acting Asst. Surg. EDWARD DAY.  
Acting Asst. Surg. C. F. HOPE.  
Acting Asst. Surg. E. A. MILLER.  
Acting Asst. Surg. G. W. SHRIVER.  
Acting Asst. Surg. J. F. MOELL.  
Acting Asst. Surg. J. E. DOUGLAS.  
Acting Asst. Surg. J. B. DUNCAN.  
Acting Asst. Surg. J. H. HARTER.  
Acting Asst. Surg. C. M. HERALD.  
Acting Asst. Surg. F. F. HOLROYD.  
Acting Asst. Surg. N. C. ICE.  
Acting Asst. Surg. E. B. LIDDLE.  
Acting Asst. Surg. T. C. MCCLUNG.  
Acting Asst. Surg. ALSTON MAXWELL.  
Acting Asst. Surg. G. S. PITCHER.  
Acting Asst. Surg. C. F. SAYRE.  
Acting Asst. Surg. C. W. UMBARGER.  
Acting Asst. Surg. H. H. YOUNG.

#### INDUSTRIAL WASTES AND SEW-AGE DISPOSAL.

(Headquarters, Hygienic Laboratory, Washington, D. C.)

Prof. E. B. PHELPS, in charge.  
Sanitary Chemist H. B. HOMMON.  
Asst. Chemist C. G. REMSBURG.  
Asst. Chemist O. H. SCHUNK.

#### INFECTIOUS DISEASES.

(Headquarters, Hygienic Laboratory, Washington, D. C.)

Surg. G. W. MCCOY, in charge.  
Special Expert R. E. BUCHANAN.  
Sanitary Bacteriologist ARTHUR LEDERER.  
Sanitary Bacteriologist C. F. BUTTERFIELD.  
Sanitary Bacteriologist R. C. SALTER.

#### MILK.

(Headquarters, Hygienic Laboratory, Washington, D. C.)

Prof. E. B. PHELPS, in charge.  
Biochemist M. X. SULLIVAN.  
Sanitary Engineer A. F. STEVENSON.  
Milk Superintendent D. C. PECK.

**PELLAGRA.**

(Headquarters, Hygienic Laboratory, Washington, D. C.)

Surg. J. GOLDBERGER, in charge.

*Field Station, Spartanburg, S. C.*

Asst. Surg. G. A. WHEELER.

Asst. Surg. R. E. DYER.

Statistician EDGAR SYDENSTRICKER.  
Statistician W. I. KING.  
Scientific Asst. G. A. DECELL.  
Scientific Asst. J. C. GOUGE.  
Scientific Asst. W. V. HOFFMAN.  
Scientific Asst. LINDSAY SWOFFORD.  
Scientific Asst. RALPH WALDEN.

*State Sanitarium, Milledgeville, Ga.*

Asst. Surg. W. S. TANNER.

**PUBLIC HEALTH ADMINISTRATION.**

Passed Asst. Surg. K. E. MILLER.

**SCHOOL HYGIENE.**

(Headquarters, 222 Bond Building, Washington, D. C.)

Surg. T. CLARK, in charge.

Passed Asst. Surg. W. L. TREADWAY.

**STREAM POLLUTION.**

(Headquarters, Third and Kilgour Streets, Cincinnati, Ohio.)

Surg. W. H. FROST, in charge.

Pharmacist F. J. HERTY.

Consultant G. C. WHIPPLE.

Consultant G. W. FULLER.

Consultant C. M. SAVILLE.

Sanitary Engineer R. E. TARBETT.

Sanitary Engineer H. W. STREETER.

Asst. Sanitary Engineer A. W. FUCHS.

Asst. Sanitary Engineer C. P. RHYNUS.

**TRACHOMA PREVENTION AND CONTROL.**

(Headquarters, post office, Lexington, Ky.)

Surg. JOHN McMULLEN, in charge.

Pharmacist L. W. RYDER.

Consultant W. B. WHERRY.

*Jackson, Ky.*

Acting Asst. Surg. T. F. WICKLIFFE.

*Louisville, Ky.*

Acting Asst. Surg. J. C. JOHNSTON.

*Greenville, Ky.*

Acting Asst. Surg. C. E. DOWNES.

*Pikeville, Ky.*

Acting Asst. Surg. R. W. RAYNOR.

*Tazewell, Tenn.*

Acting Asst. Surg. J. L. GOODWIN.

*Welch, W. Va.*

Acting Asst. Surg. J. E. YOUNGE.

**SPECIAL STUDIES OF PELLAGRA.**

Surg. J. GOLDBERGER, in charge.

*Pellagra Hospital and Laboratory, Spartanburg, S. C.*

Passed Asst. Surg. G. A. KEMPF, in temporary charge.

Asst. Surg. C. H. WARING.

Pharmacist L. G. SMITH.

Biochemist M. X. SULLIVAN.

Physiological Chemist R. E. STANTON.

Food Analyst K. K. JONES.

*Washington, D. C.*

Technical Assistant ATHERTON SEIDELL.

*Leprosy Investigation Station.*

Acting Asst. Surg. H. G. HOLLMAN, acting director.

**CONTROL OF BIOLOGIC PRODUCTS.**

Surg. G. W. MCCOY, in charge.

Passed Asst. Surg. J. P. LEAKE.

Passed Asst. Surg. N. E. WAYSON.

Sanitary Bacteriologist H. B. CORBITT.

Sanitary Bacteriologist I. A. BENGTSON.

**PLAGUE ERADICATIVE MEASURES.**

The following officers were detailed for duty in plague eradication measures in the States of Louisiana, California, and Washington:

**PLAGUE ERADICATIVE MEASURES.****LOUISIANA.**

Asst. Surg. W. C. TEUFEL, in charge.

*Officer in charge of districts.*

Acting Asst. Surg. M. D. HOLLIS.

**CALIFORNIA.**

Surg. W. C. BILLINGS, in charge.

**WASHINGTON.**

Surg. B. J. LLOYD.

**PUBLIC HEALTH LABORATORIES.**

Public health laboratories were established at different stations of the service for the prevention of the interstate spread of diseases and the carrying out of sanitary measures as follows:

## PUBLIC HEALTH LABORATORIES.

## NEW YORK, N. Y.

Passed Asst. Surg. C. W. CHAPIN, in charge.

## PITTSBURGH, PA.

## Marine Hospital.

Passed Asst. Surg. A. J. LANZA, in charge.

## CINCINNATI, OHIO.

## Third and Kilgour Streets.

Surg. W. H. FROST, in charge.

## CHICAGO, ILL.

## Marine Hospital.

Surg. J. O. COBB, in charge.

Sanitary Engineer H. P. LETTON.

## ST. LOUIS, MO.

## Marine Hospital.

Surg. L. P. H. BAHRENBURG, in charge.

## SAVANNAH, GA.

## Marine Hospital.

Acting Asst. Surg. R. H. HETERICK, in charge.

## NEW ORLEANS, LA.

## Marine Hospital.

Asst. Surg. Gen. H. R. CARTER, in charge.

## 163 Dryades Street (Plague).

Asst. Surg. W. C. TEUFEL, in charge.

## FORT STANTON, N. MEX.

Surg. F. H. McKEON, in charge.

## SEATTLE, WASH.

## No. 416 Central Building.

Surg. B. J. LLOYD, in charge.

## SAN FRANCISCO, CAL.

## Army and De Haro Streets (Plague).

Surg. W. C. BILLINGS, in charge.

## HONOLULU, HAWAII.

Surg. F. E. TROTTER, in charge.

## PREVENTION OF INTRODUCTION OF TYPHUS FEVER FROM MEXICO.

The following officers were detailed for duty in the prevention of the introduction of typhus fever from Mexico:

Passed Asst. Surg. R. M. GRIMM, Laredo, Tex.

Asst. Surg. C. R. ESKEY, Eagle Pass, Tex.

Asst. Surg. J. W. TAPPAN, El Paso, Tex.

Acting Asst. Surg. H. B. ROSS, Del Rio, Tex.

Acting Asst. Surg. LEA HUME, Eagle Pass, Tex.

Acting Asst. Surg. G. W. EDGARTON, Rio Grande City, Tex.

Acting Asst. Surg. W. P. WOODALL, Hidalgo, Tex.

Acting Asst. Surg. G. D. FAIRBANKS, Brownsville, Tex.

Acting Asst. Surg. H. W. PURDY, Nogales, Ariz.

Acting Asst. Surg. B. C. TARBELL, Naco, Ariz.

Acting Asst. Surg. E. W. ADAMSON, Douglas, Ariz.

## SANITATION OF EXTRA-CANTONMENT AREAS.

Commissioned officers and acting assistant surgeons of the service, together with a special corps of sanitary engineers, scientific assistants, bacteriologists, and other special assistants were detailed for duty in the areas surrounding cantonments, encampments, and Government industrial plants, as follows:

## ADMIRAL, MD.

Acting Asst. Surg. W. C. STONE, in charge.

## ALEXANDRIA, VA.

Scientific Asst. W. L. WOOD, in charge.

Scientific Asst. H. C. ROBLES.

Scientific Asst. H. W. SNIDOW.

Scientific Asst. W. G. CLINE.

Scientific Asst. ROY DEARSTYNE.

## ALEXANDRIA, LA.

Passed Asst. Surg. H. F. SMITH, in charge.

Acting Asst. Surg. H. N. HUTCHISON.

Asst. Sanitary Engineer H. F. S. TAIT.

Bacteriologist HENRY A. BARTELS.

## AMERICUS, GA.

Asst. Sanitary Engineer WALTER D. TIEDMAN, in charge.

Acting Asst. Surg. B. F. BOND.

## ANNISTON, ALA.

Passed Asst. Surg. J. R. RIDLON, in charge.

Asst. Sanitary Engineer SOL PINCUS.

Acting Asst. Surg. W. S. RITENOUR.

Scientific Asst. WM. H. PRICE.

Scientific Asst. W. C. VERDERY.

Scientific Asst. C. A. ABLE.

## ATLANTA, GA.

Asst. Epidemiologist C. C. APPLEWHITE.

Scientific Asst. WM. A. ELLISON.

Asst. Sanitary Engineer LOUIS H. EVANS.

Bacteriologist E. L. WEBB.

## AUGUSTA, GA.

Prof. C. W. STILES, in charge.

Sanitary Engineer H. H. WAGENHALS.

Acting Asst. Surg. E. O. SCHARNITSKY.

Bacteriologist C. F. PFAU.

## AYER, MASS.

Surg. E. K. SPRAGUE, in charge.

Scientific Asst. J. I. CONNOLLY.

## CHARLOTTE, N. C.

Asst. Surg. P. M. STEWART, in charge.

Scientific Asst. CARL R. FELLERS.

Scientific Asst. LLOYD R. JONES.

Acting Asst. Surg. C. C. HUDSON.

## EXTRA-CANTONMENT ZONE.

## CHATTANOOGA, TENN.

Passed Asst. Surg. C. P. KNIGHT, in charge.  
 Acting Asst. Surg. W. B. PARKER.  
 Acting Asst. Surg. RUSSELL A. JEWITT.  
 Scientific Asst. I. B. KRAUSE.  
 Bacteriologist CHARLOTTE HULL.  
 Bacteriologist JOSEPHINE S. PRATT.

## CHILLICOTHE, OHIO.

Surg. D. E. ROBINSON, in charge.

## COLUMBIA, S. C.

Passed Asst. Surg. FRIENCH SIMPSON, in charge.  
 Bacteriologist L. P. GEER.  
 Bacteriologist C. H. SPAULDING.

## COLUMBIA, GA.

Sanitary Engineer J. K. HOSKINS, in charge.

## CHARLESTON, S. C.

Passed Asst. Surg. W. H. SLAUGHTER, in charge.  
 Asst. Surg. L. L. WILLIAMS, Jr.

## DES MOINES, IOWA.

Asst. Surg. WM. C. WITTE, in charge.  
 Asst. Surg. F. B. ROSS.  
 Bacteriologist EVA M. BRUETT.

## EL PASO, TEXAS.

Asst. Surg. J. W. TAPPAN, in charge.

## ENGLEWOOD, N. J.

Scientific Asst. P. L. RUSH, in charge.

## FAYETTEVILLE, N. C.

Passed Asst. Surg. A. R. SWEENEY, in charge.  
 Acting Asst. Surg. O. D. ADAMSON.  
 Asst. Sanitary Engineer J. G. FOSTER.

## FLORENCE, ALA.

Asst. Surg. THOMAS PARRAN, Jr., in charge.  
 Acting Asst. Surg. W. H. ABERNATHY.  
 Acting Asst. Surg. W. E. BURT.  
 Acting Asst. Surg. W. B. ROBERTSON.  
 Sanitary Engineer W. G. STROMQUIST.  
 Asst. Sanitary Engineer H. H. FULLERTON.  
 Scientific Asst. S. R. MCKAY.  
 Bacteriologist C. F. TAFT, Jr.

## FORT WORTH, TEX.

Passed Asst. Surg. J. G. TOWNSEND, in charge.  
 Asst. Surg. J. F. MAHONEY.  
 Acting Asst. Surg. J. G. CULLINS.  
 Acting Asst. Surg. H. W. G. SHYTLER.  
 Acting Asst. Surg. S. J. WILSON.  
 Sanitary Engineer H. R. CROHUST.  
 Asst. Sanitary Engineer W. A. HARDENBURGH.  
 Scientific Asst. G. S. BOTE.

## GREENVILLE, S. C.

Passed Asst. Surg. H. F. WHITE, in charge.  
 Bacteriologist E. D. REYNOLDS.

## GULFPORT, MISS.

Sanitary Engineer L. C. FRANK, in charge.  
 Sanitary Engineer W. H. W. KOMP.  
 Asst. Sanitary Engineer A. J. WILLISON.

## HATTIESBURG, MISS.

Asst. Epidemiologist F. E. HARRINGTON, in charge.  
 Scientific Asst. A. F. ALLEN.  
 Acting Asst. Surg. W. F. REASENER.

## HOUSTON, TEX.

Surg. J. M. HOLT, in charge.  
 Scientific Asst. K. R. GLENNAN.  
 Acting Asst. Surg. GUSTAV MANN.  
 Acting Asst. Surg. J. W. McDONALD.  
 Asst. Sanitary Engineer F. D. MESSENGER.

## JACKSONVILLE, FLA.

Asst. Surg. O. H. COX, in charge.  
 Sanitary Engineer BEN J. BENSON.  
 Sanitary Engineer C. N. HARRUB.  
 Scientific Asst. W. H. BOLTON.

## LAKE CHARLES, LA.

Asst. Sanitary Engineer FRANK R. SHAW, in charge.

## LAWTON, OKLA.

Passed Asst. Surg. L. O. WELDON, in charge.

## LEAVENWORTH, KANS.

Asst. Surg. T. B. H. ANDERSON, in charge.

## LITTLE ROCK, ARK.

Asst. Epidemiologist J. C. GEIGER, in charge.  
 Sanitary Engineer R. E. TARBETT.  
 Asst. Sanitary Engineer JOSEPH F. BASH.  
 Asst. Sanitary Engineer L. D. MARS.  
 Acting Asst. Surg. IDA J. BROOKS.  
 Acting Asst. Surg. J. B. ELLIOTT.  
 Acting Asst. Surg. G. F. PUNTENEY.  
 Scientific Asst. TOM PAISLEY.  
 Bacteriologist HOMER HUNTINGTON.

## LONOKE, ARK.

Acting Asst. Surg. M. P. MCNEIL, in charge.

## LOUISVILLE, KY.

Surg. L. D. FRICKS, in charge.  
 Asst. Surg. R. P. SANDIDGE.  
 Asst. Surg. R. B. NORMENT, Jr.  
 Acting Asst. Surg. E. E. BUTLER.  
 Acting Asst. Surg. C. P. COOGLE.  
 Acting Asst. Surg. W. E. GARY.  
 Acting Asst. Surg. C. H. HARRIS.  
 Acting Asst. Surg. D. S. ROBERTS.  
 Acting Asst. Surg. L. L. SOLOMON.  
 Acting Asst. Surg. J. I. Whittenburg.

## MACON, GA.

Passed Asst. Surg. C. L. WILLIAMS, in charge.  
 Asst. Sanitary Engineer W. E. HARDENBURG.  
 Acting Asst. Surg. W. W. MERIWETHER.

## MANHATTAN, KANS.

Surg. H. G. EBERT, in charge.  
 Acting Asst. Surg. J. C. MONTGOMERY.

## MILLINGTON, TENN.

Asst. Sanitary Engineer S. B. BOWNE, in charge.

## MONTGOMERY, ALA.

Passed Asst. Surg. ROBERT OLESEN, in charge.  
 Asst. Sanitary Engineer C. H. BISHOP.  
 Acting Asst. Surg. A. TRUMPER.

**NEW LONDON, CONN.**

Passed Asst. Surg. H. C. CODY, in charge.  
Scientific Asst. W. F. PURINGTON.  
Scientific Asst. S. BURRAGE.

**NEWPORT NEWS, VA.**

Passed Asst. Surg. W. F. DRAPER, in charge.  
Asst. Sanitary Engineer G. L. CLARKE.  
Asst. Sanitary Engineer WILLIAM ROTES.  
Acting Asst. Surg. J. J. DURRETT.  
Bacteriologist W. E. GOWENS.  
Asst. Epidemiologist T. H. D. GRIFFITHS.

**PENSACOLA, FLA.**

Asst. Surg. PAUL D. MOSSMAN, in charge.  
Asst. Epidemiologist W. K. SHAW, Jr.

**PETERSBURG, VA.**

Asst. Surg. J. D. APPLEWHITE, in charge.  
Acting Asst. Surg. F. C. WEAVER.  
Acting Asst. Surg. SAM LICHTENSTEIN.

**PORTSMOUTH, N. H.**

Passed Asst. Surg. PAUL PREBLE, in charge.  
Acting Asst. Surg. A. L. STONE.  
Sanitary Bacteriologist, KATHERINE MARDEN.

**PORTSMOUTH, VA.**

Acting Asst. Surg. G. M. CONVERSE, in charge.  
Scientific Asst. F. T. FOARD.  
Sanitary Engineer L. M. FISHER.  
Asst. Sanitary Engineer E. H. PADDOCK.  
Asst. Sanitary Engineer H. E. PHELPS.

**RALEIGH, N. C.**

Passed Asst. Surg. C. E. WALLER, in charge.  
Acting Asst. Surg. PERCY AHRONS.  
Scientific Asst. H. C. WOODFALL.

**SAN ANTONIO, TEX.**

Surg. C. H. GARDNER, in charge.  
Surg. J. S. BOGGESS.  
Scientific Asst. BRUCE DELANEY.  
Scientific Asst. W. S. OBENSHAIN.

**SPARTANBURG, S. C.**

Asst. Surg. H. D. WARD, in charge.  
Asst. Surg. C. E. GIBBS.

**TACOMA, WASH. (AMERICAN LAKE).**

Senior Surg. G. M. MAGRUDER, in charge.  
Acting Asst. Surg. S. WICKES MERRITT.  
Acting Asst. Surg. C. H. WOOLSEY.

**VANCOUVER AND BREMERSTON.**

Acting Asst. Surg. T. B. TUTTLE, in charge.

**WACO, TEX.**

Passed Asst. Surg. R. A. HERRING, in charge.  
Asst. Surg. JOSEPH MOUNTAIN.  
Scientific Asst. J. B. WEBB.  
Asst. Sanitary Engineer A. J. SMALSHAE.

**WEST POINT, MISS.**

Asst. Sanitary Engineer M. G. PARSONS.

**WILMINGTON, N. C.**

Asst. Sanitary Engineer A. W. FUCHS.

**PERSONNEL, HYGIENIC LABORATORY.**

At the close of the fiscal year there were on duty in the Hygienic Laboratory, in addition to the director, 3 chiefs of divisions, 1 surgeon, 5 passed assistant surgeons, 1 assistant surgeon, 2 pharmacists, 1 artist, 6 technical assistants, 6 sanitary bacteriologists, 1 organic chemist, 1 sanitary chemist, 2 sanitary engineers, 5 assistant chemists, 3 special experts, 3 physiologists, 4 other technical employees, and 37 attendants.

**ACTING ASSISTANT SURGEONS.**

The services of 67 acting assistant surgeons have been discontinued during the fiscal year, 2 have died, and 67 have been appointed, leaving on duty at the end of the fiscal year 256 such officers. In addition to this number, 79 physicians have been employed locally for the medical relief of superintendents, keepers, and surfmen of the U. S. Coast Guard; 72 for duty in extra-cantonment sanitation; 45 in charge of venereal clinics, and 31 as directors of antivenereal measures.

**MEDICAL INSPECTORS.**

One female inspector served during the entire year for the inspection of women passengers at Honolulu, Hawaii.

**INTERNES.**

At the beginning of the fiscal year there were 17 internes on duty at the various marine hospital stations, all of whom were separated from the service by reason of termination of appointment: 15 internes are now on duty at the various marine hospitals of the service.



## PHARMACISTS.

At the beginning of the fiscal year there were on duty 50 pharmacists, divided as follows: Pharmacists of the first class, 30; second class, 15; third class, 5. One pharmacist of the first class died, 1 pharmacist of the second class resigned, and 1 pharmacist of the third class was appointed. Two pharmacists of the second class and 3 of the third class were promoted, leaving at the close of the fiscal year 49 pharmacists on duty, as follows: Pharmacists of the first class, 31; second class, 15; third class, 3.

## PILOTS AND MARINE ENGINEERS.

The number on duty at the close of the fiscal year was as follows: Pilots, 18; marine engineers, 16.

## HOSPITAL AND QUARANTINE ATTENDANTS.

At the beginning of the fiscal year 1,259 attendants were employed at the various marine hospitals, quarantine stations, and on epidemic duty, including 65 such employees on duty in the Philippine Islands, and at the close of the fiscal year there were so employed as follows:

Marine hospitals	578
Quarantine (including Porto Rico and Hawaii)	254
Epidemic	57
Laborers (extra-cantonment sanitation)	1,500
Field investigations of public health	73
	2,462
Philippine Islands	65
Total	2,527

## RECAPITULATION.

Commissioned medical officers	212
Chiefs of divisions, Hygienic Laboratory	3
Advisory board, Hygienic Laboratory	5
Acting assistant surgeons:	
General service	256
Cantonment	72
Venereal clinics	45
State boards	31
Attending physicians, Coast Guard	79
Collaborating epidemiologists	124
Internes	15
Pharmacists	49
Sanitary engineers and assistants	46
Scientific assistants and sanitary inspectors	231
Sanitary bacteriologists epidemiologists, and field directors	51
Biologists and consultants	22
Special experts, chemists, and statisticians	32
Field nurses	28
Attendants	2,527
Total	3,828

## BOARDS CONVENED.

Forty-eight boards were convened at different times and at various stations throughout the United States for the physical examination of officers of the Coast Guard and applicants for entrance therein;

2 for the physical examination of detained aliens; 14 for the examination of commissioned officers to determine their fitness for promotion to the next higher grades of the service; 8 for examination of applicants for appointment as assistant surgeons; and 3 for the examination of pharmacists to determine their fitness for promotion to a higher grade.

The bureau sanitary board has been convened in 13 sessions to pass upon reports of inspections of establishments engaged in the manufacture of vaccines, serums, toxins, etc., prior to recommending a license, and to pass upon advertised remedies and appliances to determine if said advertisements should be excluded from the mails.

One board of inquiry at the request of a commissioned officer of the service, and one board of inquiry as to the conduct of a pharmacist were convened.

## MISCELLANEOUS DIVISION.

### PUBLICATIONS.

The publication work of the service again increased materially during the past fiscal year, and more copies of publications were issued during this period than in any one year since its inception. This increase was due partly to the activities of the service in extra-cantonment areas, where it has been necessary to carry on educational work relative to the importance of hygiene and sanitation to the welfare of the general public and its bearing on the military forces. This distribution stimulated an already heavy demand for service literature, which the bureau has been unable to adequately supply. Because of a particular desire on the part of the public to secure the publication "Prevention of Disease and Care of the Sick," it was impossible to maintain editions sufficiently large to meet the demand, and consequently it was necessary to refer many applicants to the superintendent of documents for the purchase of this as well as many other documents. The inability of the service to meet these requests gratuitously was due solely to insufficient funds for printing.

During the year 75 new publications were issued the editions of which, together with reprints of previous documents, aggregated 4,364,850 copies, which is an increase over the fiscal year 1917 of 1,473,800 copies.

As in previous years, the literature of the service was classifiable into two general divisions. The first class includes those technical publications which are issued as Hygienic Laboratory bulletins. Because of their character, these bulletins are not distributed to the public generally, but are supplied to libraries, scientists, and others whose especial needs require publications of this nature. However, even this special distribution is limited on account of the restriction placed by law on the size of the editions (5,000) and the number of bulletins (10) which can be issued in any one year.

The publications included in the second class are less technical and are very valuable to health officials and the general public. Most of this literature is popular in style and designed especially for the education of the people in hygiene, sanitation, individual health, and their importance to national vitality and efficiency. The dissemination of such literature is particularly desirable at this time, when so much depends on the general vigor of the Nation. However, this extremely important work was and is handicapped by the lack of sufficient funds for printing.

The following list of service publications issued during the fiscal year 1918 gives a general idea of the scope and character of documents of the various series:

### ANNUAL REPORT.

This report records the activities of the service for the year, summarizing its operations in the various fields of work and making recommendations for the betterment of the service.

## HYGIENIC LABORATORY BULLETINS.

This series comprises the technical bulletins of the service previously mentioned. Much aid is given by this series to laboratories and technical workers. The following were published during the fiscal year 1918:

110. I. The Standardization of Antityphoid Vaccine. By George W. McCoy.  
 II. A Colorimetric Method for the Estimation of the Cresol or Phenol Preservative in Serums. By Elias Elvove.
111. Toxicity of Certain Preservatives Used in Serums, Viruses and Vaccines. By James P. Leake and Hugh B. Corbitt.
- IV. Observations on the Significance of Antisheep Amboceptor in Human Serum, with reference to complement fixation test for syphilis. By Mather H. Neill.
112. I. The Pathology and Pathogenesis of Myelitis. By N. E. Wayson.  
 II. Experimental Poliomyelitis. By J. P. Leake.
113. Attempts to Induce Poliomyelitis in Small Laboratory Animals. By A. M. Stimson.
- IV. Report on Attempts to Cultivate the Virus of Poliomyelitis. By N. E. Wayson.
112. I. Phenols as Preservatives of Antipneumococcic Serum. A pharmacological study. By Carl Voegtlin.
- II. The Nature of Contaminations of Biological Products. By I. A. Bengtson.
113. Studies in Preservatives of Biological Products. The effects of certain substances on organisms found in biological products. By M. H. Neill.
- IV. The Effect of Ether on Tetanus Spores and on Certain other Microorganisms. By H. B. Corbitt.

## PUBLIC-HEALTH BULLETINS.

These bulletins are less technical in character than the preceding series. Many are popular in style and have proved valuable for distribution to the general public in connection with campaigns to improve health in various localities. Practically all of the bulletins of this series are of value to health officers, who frequently find in them the solution of local health problems. The following were issued during the year:

86. Investigations of the Pollution of Certain Tidal Waters of New Jersey, New York and Delaware, with special reference to bathing beaches and shellfish-bearing areas. By Hugh S. Cumming.
87. Stream Pollution. A digest of judicial decisions and a compilation of legislation relating to the subject. By Stanley D. Montgomery and Prof. Earle B. Phelps.
88. Malaria Control. A report of demonstration studies conducted in urban and rural sections. By R. C. Derivaux, H. A. Taylor, and T. D. Haas.
89. A Sanitary-privy System for Unsewered Towns and Villages. By L. L. Lumsden.
90. Mentality of the Arriving Immigrant. By E. H. Mullan.
92. Color Blindness. Its relation to other ocular conditions, and the bearing on public health of tests for color-sense acuity. By George L. Collins.
93. Transactions of the Fifteenth Annual Conference of State and Territorial Health Officers with the United States Public Health Service. Held at Washington, D. C., April 30 and May 1, 1917.

## WEEKLY PUBLIC HEALTH REPORTS.

These reports are issued every Friday and in conformity with law are distributed to "health officers," "collectors of customs," and "other sanitarians." The reports of the occurrence and prevalence

of disease, together with other public health statistics, appearing each week in this series, give the health officer definite information of the existence and extent of epidemics of disease and thus materially aid him in protecting the health of his community. Each issue also contains one or more timely articles in popular style on live health topics. These articles, as mentioned hereafter, are then reprinted in large quantities. The weekly editions during the past year reached a maximum of 13,700 copies.

#### REPRINTS FROM THE PUBLIC HEALTH REPORTS.

These documents are reprints of the leading articles appearing each week in the Public Health Reports as above mentioned. By reissuing them in pamphlet form it is possible to make a wide distribution at small cost. The scope and character of these reprints, and their value to health officers, technical workers, and the public, become evident from a reading of the following list of those issued during the fiscal year 1918:

399. **Immunization Against Typhus Fever.** A report of an unsuccessful attempt to immunize monkeys against typhus infection by cultures of *B. typhi exanthematici* (Plotz). By G. W. McCoy and M. H. Neill.
400. **Occupation and Mortality.** Their relation as indicated by the mortality returns in the city of New York for 1914. By Shirley Wilmore Wynne and William H. Guilfoyle.
405. **State and Insular Health Authorities, 1917.**
406. **State Laws and Regulations Pertaining to Public Health.**
407. **Anopheles Punctipennis.** A note on its ability to serve as a host for *Plasmodium Falciparum*. By Bruin Mitzmain.
408. **Trachoma and the Army.** The dangers incident to enlisting recruits affected with the disease. By John McMullen.
409. **Experimental Typhus Fever in Guinea Pigs.** A description of a serotal lesion in guinea pigs infected with Mexican typhus. By M. H. Neill.
410. **Court Decisions Pertaining to the Public Health.** Published in the Public Health reports during the calendar year 1916.
411. **Malaria in North Carolina.** Prevalence and geographic distribution.
412. **Hay Fever.** Its causes and prevention in the Rocky Mountain and Pacific States. By William Scheppegegrell.
413. **Menogococcus Carriers.** Their recognition and treatment.
414. **Malaria in Louisiana.** Prevalence and geographic distribution.
415. **Malaria in Kentucky.** Prevalence and geographic distribution.
416. **Directory of City Health Officers.** Containing the names and official titles of the health officers of cities having a population of 10,000 and over in 1910.
417. **Public Health Administration in Springfield, Ohio.** By Carroll Fox.
418. **Certain Military Aspects of Hookworm Disease.** By Ch. Wardell Stiles.
419. **Malaria in Eastern Texas.** Prevalence and geographic distribution.
420. **Malaria in Tennessee.** Prevalence and geographic distribution.
421. **The Notifiable Diseases.** Small cities, 1916.
422. **The Malaria Parasite in the Mosquito.** The effects of low temperature and other factors on its development. By M. Bruin Mitzmain.
423. **Rodent Destruction on Ships.** A report on the relative efficiency of fumigants as determined by subsequent intensive trapping over a period of one year. By R. H. Creel and Frieuch Simpson.
424. **Tetanus in Court-Plaster.** Results of the bacteriological examination of 14 specimens. By G. W. McCoy, J. P. Leake, and H. B. Corbitt.
425. **A New Water Sample Shipping Case.** With some observations on the changes that take place in stored samples of water. By R. R. Spencer and H. P. Letton.
426. **The Notifiable Diseases.** Prevalence in States, 1916.
427. **Public Health Administration in Quincy, Ill.** By Carroll Fox.
428. **Ventilation after Fumigation.** Artificial ventilation of ships after fumigation with hydrocyanic-acid gas. By S. B. Grubbs.

429. **The Lighting of Industrial Establishments.** The need of supervision with a suggested system of maintenance rating for artificial-light equipment. By Davis H. Tuck.
430. **Diphtheria.** An epidemic, probably of milk origin, at Newport, R. I., and vicinity. By G. W. McCoy, Joseph Bolton, and H. S. Bernstein.
431. **The Diagnosis of Poliomyelitis.** By J. P. Leake.
432. **The Bacteriological Examination of Water.** Comparative study of media used. By H. E. Hasseltine.
433. **The Simulation of Disease.** Drugs, chemicals and septic materials used therefor. By A. G. Dumez.
434. **Trinitrotoluol.** Practical points in its safe handling. By J. W. Schereschewsky.
435. **Vaccination Against Smallpox.** The kind of vaccine to use and how to use it.
436. **The Control of Communicable Diseases.** Report of the American Public Health Association committee on standard regulations, appointed in October, 1916.
437. **Winter Outbreak of Poliomyelitis, Elkins, W. Va. 1916-17.** By J. P. Leake, Joseph Bolton, and H. F. Smith.
438. **Public Health Laboratory Specimens.** Their preparation and shipment. By H. E. Hasseltine.
439. **Appropriations for City Health Departments.** Summary of expenditures of 330 cities in the Central and Eastern United States for public-health work. By Paul Preble.
440. **The Accuracy of Certified Causes of Death.** Its relation to mortality statistics and the international list. Report of a committee of the vital-statistics section of the American Public Health Association.
441. **Mitigation of the Heat Hazard in Industries.** By J. A. Watkins.
442. **The Massachusetts Endemic Index.** By Walter H. Brown.
443. **Extra-Cantonment Zone Sanitation.** Camp Shelby, near Hattiesburg, Miss. By J. A. Watkins.
444. **Malaria in Alabama.** Prevalence and geographic distribution, 1915 and 1916.
445. **Public Health Administration in Russia in 1917.** By C. E. A. Winslow.
446. **Malaria in Florida.** Prevalence and geographic distribution.
447. **The Control of Venereal Diseases.**
448. **Industrial Efficiency.** The bearing of physiological science thereon. A review of recent work. By Frederic S. Lee.
449. **Malaria in South Carolina.** Prevalence and geographic distribution, 1915 and 1916.
450. **Venereal-Disease Legislation.** A compilation of laws and regulations showing the trend of modern legislation for the control of venereal diseases.
451. **Malaria in Arkansas.** Prevalence and geographic distribution, 1915 and 1916.
452. **Morbidity Statistics of War Industries Needed.** By B. S. Warren and Edgar Sydenstricker.
453. **Effect of Freezing on the Organisms of Typhoid Fever and Diphtheria.** By Joseph Bolton.
454. **Prophylaxis of Malaria.** Immunization by Quinine. By H. R. Carter.
456. **The Application of Ozone to the Purification of Swimming Pools.** By Wallace A. Manheimer.
457. **Extra-Cantonment Zone Sanitation.** Newport News, Va., and vicinity. By S. B. Grubbs.
458. **Methods for Field Study of Industrial Fatigue.** By P. Sargent Florence.
459. **Suggestions for State Board of Health Regulations for the Prevention of Venereal Diseases.** Approved by the Surgeon General of the Army, Surgeon General of the Navy, and Surgeon General of the Public Health Service.
461. **Pellagra: Its Nature and Prevention.** By Joseph Goldberger.
462. **A New Disinfectant-Testing Machine.** By A. M. Stimson and M. H. Neill.
463. **Breeding of Anopheles Quadrimaculatus in Deep Water and at a Distance from Shore.** By H. R. Carter.
464. **Effect of Anopheles Punctipennis on the Natural Conveyance of Malarial Fever.** By H. R. Carter.
465. **The Present Status of Our Knowledge of Fatigue Products.** By Ernest L. Scott.

## SUPPLEMENTS TO THE PUBLIC HEALTH REPORTS.

These publications are popular in style and especially designed for distribution to the general public and are used extensively throughout the country in connection with general health campaigns. The large demand for these documents attest their value.

The following were issued during the year:

31. **Safe Milk.** An Important Food Problem. By Ernest A. Sweet.
32. **Field Identification of Malaria-Carrying Mosquitoes.** By Ernest A. Sweet.

## MISCELLANEOUS PUBLICATIONS.

This series comprises certain documents of the service, such as administrative regulations, lists of reference, and others not properly classifiable under the preceding series.

17. **Prevention of Disease and Care of the Sick.** How to keep well and what to do in case of sudden illness. By W. G. Stimpson. With a supplement on **First-Aid to the Injured.** By R. M. Woodward.

## NEEDS OF THE SERVICE.

*National quarantine.*—It is desired to urge the completion of the national quarantine system by acquiring the Baltimore and New York quarantine functions.

The New York quarantine is at present owned and controlled by the State of New York. The State has indicated its desire to transfer this station to the National Government with the provision that the National Government reimburse the State for the property according to valuation placed thereon by appraisers representing both the State and the Federal Government.

The authorities of Baltimore have taken similar action regarding the quarantine reservations located in that city. The outcome of this favorable action on the part of New York and Baltimore authorities depends upon the enactment by Congress of legislation which will incorporate into the national chain these two important reservations.

There are many arguments in favor of the national control of quarantine. The chief among these are the following:

1. Uniformity of quarantine procedure at all ports of the country, thus eliminating the possibility of discriminatory practices.
2. Adjustment of international questions involved in quarantine methods.
3. Availability of cooperative assistance from other national agencies, such as the Customs and the Immigration Services.

It is respectfully recommended that the national quarantine stations at the ports of Norfolk, Mobile, New Orleans, and San Francisco be relocated at the earliest possible time. While it seems somewhat unwise to make any change just at present on account of the more pressing demands on the Government, it does seem advisable to point out the expediency of relocating these stations at an early date.

Formerly and before the underlying principles of modern preventive medicine were fully appreciated, it was deemed essential that quarantine stations should be located at points as remote from

human habitation as practicable. The result of this erroneous idea was that quarantine stations frequently were placed at points most inaccessible, with consequent interference with administrative efficiency and convenience to the public.

New Orleans quarantine station is located some 90 miles below the city of New Orleans; Mobile 30 miles from the city of Mobile; Norfolk some 20 miles from the port which it was designed to protect, and at San Francisco the station (while not so far distant from the port), is very inaccessible. These factors tend to result in unnecessarily expensive maintenance, discontent among the employees because of the isolation and unnecessary inconvenience to shipping interests.

*Field investigation.*—It is recommended that increased appropriations be made available for the continuation and expansion of rural sanitation demonstrations studies, the need for which has become apparent as the results of the surveys have become known.

Additional funds are also needed for the expansion of the sanitary surveys of industrial workers and plants, so that conditions generally may be made known and recommendations made to these plants for the correction of defects which retard the production of munitions and other war supplies.

It is recommended that additional funds be provided for systematic studies of disease of unknown etiology and transmission.

The necessity for each and every one of the appropriations just mentioned has become greater as increasing demands are being made upon the man power of the country. It is now of paramount importance that a systematic program of public health be undertaken without delay by the Federal Government on a much larger scale than previously in order to protect the health of the public at this crucial moment.

*Medical treatment.*—It is recommended that the relief work of the service be extended to include the care and treatment of civil employees when ill, to promote their efficiency, and in order that they will be more contented with their work. The best welfare work that can be done for employees is to provide for their medical treatment when ill.

Hospital accommodations should be supplied for the treatment of discharged soldiers and seamen—beneficiaries of the Bureau of War Risk Insurance. The Army has made no provision for the care of these patients, and 14,000 have already been discharged from the Army for tuberculosis alone, and it is estimated that 20,000 will be discharged in the remainder of the calendar year 1918 and during the year 1919.

*Reports of prevalence of disease.*—It is recommended that appropriations be increased in order that the present system of collaborating and assistant collaborating epidemiologists may be extended as fast as practicable.

For the industrial group of the population morbidity reports should be obtained wherever practicable through the appointment of industrial surgeons and record clerks in the various industrial establishments willing to cooperate—the industrial surgeons to be appointed at a nominal salary, the remainder of the salary to be paid by the industrial establishment to which they are attached.



Morbidity reports should be obtained for health education in order to increase the knowledge of the general public on measures relating to disease prevention and personal hygiene. This is especially needed at this time when there is a shortage of doctors and nurses.

*Publications.*—Because of additional activities engaged in by the service during the fiscal year 1918 a corresponding increase in the demand for service literature has resulted. It is obvious that the distribution of this literature, which deals with various phases of public health, sanitation, and personal hygiene, is of great benefit to the Nation, and is highly desirable at a time when such large numbers of troops are mobilized in various sections of the country and which must of necessity come in contact with the civil population.

Owing to the limited appropriation for printing the bureau has been unable to supply the demands for several of its most popular publications, which should be widely distributed at this time. This is particularly desirable now in view of the increasing difficulty of securing medical attention, especially in rural communities, resulting from the enlistment of a large proportion of the medical profession for military service.

The distribution of service literature in the extra-cantonment areas has been largely responsible for a general movement in the various communities looking to the betterment of their surrounding sanitary conditions. In order that this work may be carried on with increasing effectiveness during the coming fiscal year, it is recommended that additional funds for printing be provided.

RUPERT BLUE, *Surgeon General.*

To the honorable WM. G. McADOO,  
*Secretary of the Treasury.*



# APPENDIX.

## FINANCIAL STATEMENT.

*Receipts and expenditures, Public Health Service, for the fiscal year ended June 30, 1918.*

### APPROPRIATION: "PUBLIC HEALTH SERVICE, 1918."

Subheads of appropriations.	Appropriations and repayments.	Expenditures.	Balance June 30, 1918.
Pay, etc., commissioned officers and pharmacists.....	\$751,490.00	\$737,694.05	\$13,795.95
Pay of acting assistant surgeons.....	300,000.00	257,937.04	42,062.96
Pay of other employees.....	540,000.00	520,249.34	19,750.66
Freight, transportation, etc.....	30,000.00	29,304.61	695.39
Fuel, light, and water (appropriation \$105,000).....	115,724.92	108,086.96	7,637.96
Furniture, etc.....	8,000.00	7,967.28	32.72
Purveying depot supplies (appropriation \$70,000).....	77,497.51	76,612.94	884.57
Maintenance, Hygienic Laboratory.....	20,000.00	19,950.88	49.12
Maintenance, marine hospitals (appropriation \$356,000).....	399,228.09	383,031.91	16,196.18
Care of seamen, etc. (appropriation \$214,000).....	228,073.86	221,245.61	6,828.25
Books.....	500.00	398.41	101.59
Disbursements.....		<sup>1</sup> 2,299,115.98	
Encumbrances.....		63,363.05	
Total (appropriation \$2,394,990).....	2,470,514.38	2,362,479.03	108,035.35

<sup>1</sup> Includes \$1,400 transferred to "Contingent expenses, Treasury Department, stationery, 1918."

NOTE.—For expenditures by stations under marine hospitals and relief see Statistical Table 2, p. 325.

### APPROPRIATION "QUARANTINE SERVICE, 1918."

Amount of appropriation.....	\$195,000.00
Repayments.....	35,086.90
Total.....	230,086.90
Expenditures:	
Disbursements.....	<sup>1</sup> 192,516.54
Encumbrances.....	11,247.76
Balance June 30, 1918.....	26,322.60

<sup>1</sup> Includes \$500 transferred to "Contingent expenses, Treasury Department, Stationery, 1918."

### [SUMMARY OF TOTALS. (See p. 327.)]

Total expenditures for first-class stations.....	\$839,804.92
Total expenditures for second, third, and fourth class stations.....	288,541.13
Washington, D. C.:	
Bureau.....	56,243.83
Hygienic Laboratory.....	140,353.53
Purveying Depot.....	87,022.25
Coast and Guard Cutters and other duties.....	48,206.89
Immigration.....	203,796.93
Miscellaneous duty, travel, etc.....	113,767.11
Total expenditures.....	1,777,736.59

### Expenditures by stations.

Name of station.	Pay and allowances, officers and employees. <sup>1</sup>	Maintenance.	Total maintenance, pay, and allowances.
Alaska.....	\$300.00		\$300.00
Alexandria, Va.....		\$0.25	.25
Beaufort, S. C.....	750.00	323.99	1,073.99
Biscayne Bay, Fla.....	1,547.83		1,547.83
Boca Grande, Fla.....	892.16	247.01	1,139.17
Boston, Mass.....	21,864.27	27,438.62	49,302.89
Brunswick, Ga.....	2,026.00	1,606.32	3,632.32
Cape Charles, Va.....	13,753.29	12,431.88	26,185.17
Cape Fear, N. C.....	4,695.00	4,342.10	9,037.10
Cedar Keys, Fla.....	300.00		300.00
Charleston, S. C.....	9,205.83	4,049.64	13,255.47
Columbia River, Ore.....	8,803.16	4,455.74	13,258.90
Coos Bay, Ore.....		.25	.25
Cumberland Sound, Fla.....	3,180.00	167.80	3,347.80
Darien, Ga.....	20.00		20.00
Delaware Bay and River.....	2,689.99	2,738.48	5,428.47
Delaware Breakwater, Del.....	3,765.01	2,058.89	5,823.90
Eagle Pass, Tex.....	1,800.00		1,800.00
Eastport, Me.....	1,220.00		1,220.00
Eureka, Cal.....	330.00	10.00	340.00
Galveston, Tex.....	16,620.40	10,806.71	27,427.11

<sup>1</sup> Paid from pay items appropriation "Public Health Service, 1918."

*Expenditures by stations—Continued.*

Name of station.	Pay and allowances, officers and employees.	Maintenance.	Total maintenance, pay and allowances.
Georgetown, S. C.	\$300.00	\$15.00	\$315.00
Gulf, Miss.	5,661.16	2,338.36	7,999.52
Hawaii	28,319.83	12,294.40	40,614.23
Key West, Fla.	3,674.45	1,295.01	4,969.46
Laredo, Tex.	1,640.00	328.50	1,968.50
Miscellaneous		3,975.00	3,975.00
Mobile, Ala.	10,462.75	7,151.00	17,613.75
New Orleans, La.	21,664.71	15,808.54	37,473.25
Pascagoula, Miss.	777.50	74.45	851.95
Pensacola, Fla.	6,153.82	5,041.51	11,195.33
Perth Amboy, N. J.	1,670.84	1,260.00	2,930.84
Portland, Me.	4,562.32	3,089.43	7,651.75
Porto Rico	24,257.65	7,524.00	31,781.65
Port Royal, S. C.	300.00		300.00
Port San Luis	220.00		220.00
Port Townsend, Wash.	15,646.05	4,275.72	19,921.77
Providence, R. I.	5,947.34	1,418.21	7,365.55
Reedy Island, Del.	18,438.55	18,612.66	37,051.21
St. Andrews, Fla.	550.00	153.00	703.00
St. Georges Sound, Fla.	290.00	120.00	410.00
St. Johns River, Fla.	1,997.50	755.59	2,753.09
St. Joseph, Fla.	80.00	171.00	251.00
San Diego, Cal.	8,398.00	2,912.78	11,310.78
San Francisco, Cal.	32,617.64	27,780.79	60,398.43
San Pedro, Cal.	852.50	424.95	1,277.45
Savannah, Ga.	8,155.61	6,637.10	14,792.71
Tampa Bay, Fla.	7,118.47	6,454.10	13,572.57
Leprosy Hospital, Hawaii	8,274.25	3,175.52	11,449.77
Total	311,799.88	203,764.30	515,564.18

## APPROPRIATION: "PREVENTING THE SPREAD OF EPIDEMIC DISEASES, 1918."

Amount of appropriation	\$400,000.00
Repayments	1,318.16
Total	401,318.16
Expenditures:	
Disbursements	<sup>1</sup> \$267,537.69
Encumbrances	5,198.10
As follows—	
Plague eradication measures—	
Louisiana	109,481.61
California	43,507.59
Washington	3,393.33
Prevention of trachoma—	
Kentucky	26,060.46
Tennessee	7,487.90
West Virginia	10,745.12
Typhus fever prevention, Texas border	42,808.65
Preventive measures—	
Baltimore quarantine	4,659.07
Virgin Island quarantine	557.32
Cuba, South America, Mexico	7,442.79
China, Italy	1,835.35
Vaccine	6,538.77
Travel, telegrams, stationery, etc.	8,217.83
	272,735.79
Balance June 30, 1918	128,582.37

NOTE.—Payments amounting to \$73,199.69 were made from pay items of appropriation "Public Health Service, 1918," account of epidemic duty.

## APPROPRIATION: "FIELD INVESTIGATIONS OF PUBLIC HEALTH, 1918."

Amount of appropriation	\$200,000.00
Expenditures:	
Disbursements	<sup>2</sup> \$192,989.70
Encumbrances	4,118.53
	197,108.23
Balance June 30, 1918	2,891.77

NOTE.—Payments amounting to \$31,929.32 were made from the appropriation "Pay, etc., commissioned officers and pharmacists, Public Health Service, 1918," on account of field investigations.

<sup>1</sup> Includes \$200 transferred to "Contingent expenses, Treasury Department, stationery, 1918."

<sup>2</sup> Includes \$400 transferred to "Contingent expenses, Treasury Department, stationery, 1918."

## APPROPRIATION: "NATIONAL QUARANTINE AND SANITATION."

Balance June 30, 1918.....	\$810.63.
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## APPROPRIATION: "INTERSTATE QUARANTINE SERVICE, 1918."

Amount of appropriation.....	\$315,000.00 <sup>1</sup>
Expenditures:	
Disbursements.....	<sup>1</sup> \$305,520.11
Encumbrances.....	8,461.26
	<u>313,681.37</u>
Balance June 30, 1918.....	1,318.63

NOTE.—Payments amounting to \$80,432.17 were made from pay items of appropriation "Public Health Service, 1918," on account of interstate quarantine.

## APPROPRIATION: "SPECIAL STUDIES OF PELLAGRA, PUBLIC HEALTH SERVICE, 1918."

Amount of appropriation.....	\$40,000.00
Expenditures.....	<sup>1</sup> 28,890.57
Balance June 30, 1918.....	11,109.43

NOTE.—Payments amounting to \$7,646 were made from appropriation "Pay, etc., commissioned officers and pharmacists, Public Health Service, 1918," on account of special studies of pellagra.

## APPROPRIATION: "STUDIES OF RURAL SANITATION, PUBLIC HEALTH SERVICE, 1918,"

Amount of appropriation.....	\$150,000.00
Expenditures:	
Disbursements.....	<sup>2</sup> \$130,740.21
Encumbrances.....	7,059.43
	<u>137,799.64</u>
Balance June 30, 1918.....	12,200.36

NOTE.—Payments amounting to \$24,290.90 were made from appropriation "Pay, etc., commissioned officers and pharmacists, Public Health Service, 1918," on account of studies of rural sanitation.

## APPROPRIATION: "CONTROL OF BIOLOGIC PRODUCTS, PUBLIC HEALTH SERVICE, 1918."

Amount of appropriation.....	\$20,000.00
Expenditures.....	<sup>3</sup> 19,794.92
Balance June 30, 1918.....	205.08

## APPROPRIATION: "PROTECTING HEALTH OF THE MILITARY FORCES, PUBLIC HEALTH SERVICE, 1918-19."

Amount of appropriation.....	\$500,000.00
Expenditures.....	469,742.32
Balance June 30, 1918.....	30,257.68

NOTE.—Payments amounting to \$55,444.48 were made from appropriation "Pay, etc., commissioned officers and pharmacists, Public Health Service, 1918," on account protecting health of military forces.

## APPROPRIATION: "SALARIES OFFICE OF SURGEON GENERAL, PUBLIC HEALTH SERVICE, 1918."

Amount of appropriation.....	\$63,830.00
Expenditures.....	62,189.44
Balance June 30, 1918.....	1,640.56

## APPROPRIATION: "NATIONAL HOME FOR LEPERS."

Balance July 1, 1917.....	\$249,933.52
Expenditures.....	192.29
Balance June 30, 1918.....	249,741.23

## APPROPRIATION: "INCREASE OF COMPENSATION, TREASURY DEPARTMENT, 1918."

Total payments, Public Health Service.....	\$85,283.55
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<sup>1</sup> Includes \$100 transferred to "Contingent expenses, Treasury Department, stationery, 1918."

<sup>2</sup> Includes \$150 transferred to "Contingent expenses, Treasury Department, stationery, 1918."

<sup>3</sup> Includes \$50 transferred to "Contingent expenses, Treasury Department, stationery, 1918."

## MISCELLANEOUS APPROPRIATIONS.

## LEPROSY HOSPITAL, HAWAII.

Balance June 30, 1918 (act Mar. 3, 1905).....	\$16,956.35
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## MARINE HOSPITALS.

Baltimore, Md. (act Mar. 28, 1918), construction.....	\$189,000.00
Baltimore, furniture and equipment.....	\$18,000.00
Expenditures.....	15.00

Balance June 30, 1918.....	17,985.00
Boston, Mass. (act Mar. 28, 1918), construction.....	158,700.00
Boston, Mass., furniture and equipment.....	\$21,600.00
Expenditures.....	262.20

Balance June 30, 1918.....	21,337.80
Detroit, Mich. (act Mar. 28, 1918), construction.....	31,500.00
New Orleans, La. (act Mar. 28, 1918), construction.....	162,000.00
New Orleans, La., furniture and equipment.....	18,000.00
New York, N. Y. (act Mar. 28, 1918), construction.....	256,500.00
New York, N. Y., furniture and equipment.....	\$45,000.00
Expenditures.....	130.00

Balance June 30, 1918.....	44,870.00
San Francisco, Cal. (act Mar. 28, 1918), construction.....	216,000.00
San Francisco, Cal., furniture and equipment.....	22,500.00
Savannah, Ga. (act Mar. 28, 1918), construction.....	126,000.00
Savannah, Ga., furniture and equipment.....	9,000.00

## [Balances June 30, 1918.]

Cleveland, Ohio (act Mar. 4, 1909).....	100.00
Cleveland, Ohio (act Mar. 4, 1907).....	374.95
Cleveland, Ohio (act July 26, 1916).....	1,000.00
Fort Stanton, N. Mex. (act Aug 24, 1912).....	3.20

## QUARANTINE STATIONS.

Boston (act July 1, 1916).....	150,000.00
Expenditures.....	150,000.00
Columbia River (act July 1, 1916), balance.....	4,264.19
Expenditures.....	63.00

Balance June 30, 1918.....	4,201.19
Columbia River (act June 12, 1917).....	25,000.00
Gulf (act June 12, 1917).....	8,000.00
Key West (act June 12, 1917).....	7,000.00

## [Balances June 30, 1918.]

Brunswick (act June 25, 1910).....	1,708.87
Charleston (act Mar. 4, 1909).....	634.46
Columbia River (act June 25, 1910).....	745.47
Delaware Breakwater (act Mar. 4, 1907).....	857.00
Gulf (act Mar. 4, 1907).....	353.35
Honolulu (act Sept. 8, 1916).....	10,000.00
Honolulu (act Mar. 4, 1907).....	390.52
Mobile (act July 1, 1916).....	10,000.00
New Orleans (act July 1, 1916).....	25,000.00
Pensacola (act Mar. 4, 1907).....	18.02
Reedy Island (act Mar. 4, 1909).....	66.71
San Francisco (act Mar. 27, 1908).....	180.75
San Francisco (act June 30, 1906).....	1,511.71
Savannah (act Mar. 4, 1909).....	410.85

## UNDER SUPERVISING ARCHITECT.

## MARINE HOSPITALS.

Baltimore, Md. (act June 12, 1917).....	5,000.00
Cincinnati, Ohio (act June 12, 1917).....	10,000.00
Key West, Fla. (act June 12, 1917).....	5,000.00
New York, N. Y. (act June 12, 1917).....	25,000.00
Port Townsend, Wash. (act June 12, 1917).....	1,000.00

## QUARANTINE STATIONS.

Columbia River (act June 12, 1917).....	2,000.00
New Orleans, La. (act June 12, 1917).....	5,000.00
Savannah, Ga. (act June 12, 1917).....	4,000.00
Boston (act Oct. 6, 1917).....	187,800.00
Cape Charles (act Oct. 6, 1917).....	225,826.00
Reedy Island (act Oct. 6, 1917).....	32,000.00
Savannah (act Oct. 6, 1917).....	98,644.00

## STATISTICAL TABLES.

TABLE 1.—Comparative table of number of patients annually treated, 1868 to 1918.

Fiscal year.	Sick and disabled seamen furnished relief.	Fiscal year.	Sick and disabled seamen furnished relief.
Prior to reorganization:		After reorganization—Continued.	
1868.....	11,535	1893.....	53,317
1869.....	11,356	1894.....	52,803
1870.....	10,560	1895.....	52,643
After reorganization:		1896.....	53,804
1871.....	14,256	1897.....	54,477
1872.....	13,156	1898.....	52,709
1873.....	13,529	1899.....	55,489
1874.....	14,356	1900.....	56,355
1875.....	15,009	1901.....	58,381
1876.....	16,808	1902.....	56,310
1877.....	15,175	1903.....	58,573
1878.....	18,223	1904.....	58,556
1879.....	20,922	1905.....	57,013
1880.....	24,860	1906.....	54,363
1881.....	32,613	1907.....	55,129
1882.....	36,184	1908.....	54,301
1883.....	40,195	1909.....	53,704
1884.....	44,761	1910.....	51,443
1885.....	41,714	1911.....	52,209
1886.....	43,822	1912.....	51,078
1887.....	45,314	1913.....	50,604
1888.....	48,203	1914.....	53,226
1889.....	49,518	1915.....	55,782
1890.....	50,671	1916 <sup>1</sup> .....	68,398
1891.....	52,992	1917 <sup>2</sup> .....	64,022
1892.....	53,610	1918 <sup>2</sup> .....	71,806

<sup>1</sup> Includes patients treated at trachoma hospitals.<sup>2</sup> Does not include patients treated at trachoma hospitals.

TABLE 2.—Transactions at marine hospitals and other relief stations, fiscal year 1918.

	Total number of patients treated.	Total number treated in hospital.	Died.	Re-main-ing in hos-pital June 30, 1918.	Num-ber of days' relief in hos-pital.	Num-ber of pa-tients fur-nished office relief.	Num-ber of times office relief was fur-nished.	Num-ber of persons exam-ined physi-cally includ-ing pilots.	Amount expended.
<b>Grand total.....</b>	<b>71,806</b>	<b>20,609</b>	<b>570</b>	<b>1,544</b>	<b>534,991</b>	<b>53,599</b>	<b>96,064</b>	<b>30,055</b>	.....
<i>First-class stations.</i>									
Baltimore, Md.....	2,544	758	25	108	33,306	1,786	2,952	1,750	\$54,043.42
Boston, Mass.....	2,742	1,172	32	82	33,053	1,570	2,373	1,388	55,626.35
Buffalo, N. Y.....	1,654	420	14	26	10,013	1,234	2,108	1,461	25,081.48
Chicago, Ill.....	1,806	870	15	66	23,053	936	1,179	3,215	59,683.69
Cleveland, Ohio.....	2,201	680	21	57	12,300	1,521	2,523	906	27,047.56
Detroit, Mich.....	1,146	410	18	33	10,525	736	999	448	32,031.34
Evansville, Ind.....	702	98	1	10	2,245	604	908	41	15,276.29
Fort Stanton, N. Mex.....	372	372	54	236	80,385	.....	.....	.....	153,749.79
Key West, Fla.....	634	331	4	7	7,783	303	406	44	19,516.42
Louisville, Ky.....	512	182	5	25	5,448	330	333	185	14,015.23
Memphis, Tenn.....	993	312	5	16	6,829	681	1,258	67	16,171.77
Mobile, Ala.....	1,120	380	7	35	8,909	740	1,159	434	20,962.91
New Orleans, La.....	2,887	947	30	72	25,691	1,940	4,638	46	709.35
New York, N. Y.....	6,309	2,597	56	166	51,874	6,205	9,719	5,669	101,894.58
Portland, Me.....	591	229	8	13	6,301	272	272	299	29,487.39
Port Townsend, Wash.....	391	325	11	51	17,957	66	108	22	27,542.13
St. Louis, Mo.....	1,175	296	10	33	11,044	879	910	112	32,531.83
San Francisco, Cal.....	4,386	1,816	55	142	53,331	2,570	4,062	1,607	74,031.39
Savannah, Ga.....	1,230	513	13	50	11,679	717	742	605	23,599.11
Vineyard Haven, Mass.....	196	89	1	9	3,739	107	140	4	10,802.83
<b>Total.....</b>	<b>33,501</b>	<b>12,797</b>	<b>385</b>	<b>1,237</b>	<b>415,465</b>	<b>23,197</b>	<b>36,789</b>	<b>18,257</b>	<b>839,804.92</b>

TABLE 2.—Transactions at marine hospitals and other relief stations, fiscal year 1918—Continued.

	Total number of patients treated.	Total number treated in hospital.	Died.	Remaining in hospital June 30, 1918.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically including pilots.	Amount expended.
<i>Second, third, and fourth class stations.</i>									
Albany, N. Y.	98	11	1		312	87	152		\$1,046.97
Ancon and Colon, Canal Zone.									
Apalachicola, Fla.	425	320	5	20	4,708	105	149		9,688.17
Ashland, Wis.	125	28	1	1	300	97	248		1,109.59
Ashtabula, Ohio.	151	32		1	596	122	235		1,485.45
Astoria, Oreg.	267	28			430	239	329	19	1,596.80
Bangor, Me.	155	33		1	522	122	215	53	2,531.62
Barnstable, Mass.	29	3			91	26	31	50	640.40
Bay City, Mich.	3					3	12		13.00
Beaufort, N. C.	53	13			183	40	82	34	447.50
Beaufort, S. C.	155					155	158	11	480.00
Bellingham, Wash.	10					10	10	5	13.25
Boothbay Harbor, Me.	47	5			96	42	42		300.80
Bridgeport, Conn.	70	22			174	48	91	36	634.20
Brunswick, Ga.	11	10		2	229	1	1		405.00
Burlington, Iowa.	54	16	1		136	38	44	8	846.00
Cairo, Ill.	34	15		1	317	19	19		704.83
Cambridge, Md.	950	103			808	847	1,489	13	4,304.64
Cedar Keys, Fla.	20	16	1	1	567	4	5	4	1,116.29
Charleston, S. C.	26	5			59	21	21		64.00
Chattanooga, Tenn.	474	48	1	3	360	426	672	84	2,793.43
Cincinnati, Ohio.	2	2			21				52.50
Cordova, Alaska.	151	15		1	205	136	172	67	964.95
Crisfield, Md.	43	31		2	469	12	12		2,251.00
Delaware Breakwater, Del.	163	16			94	147	147	4	585.54
Duluth, Minn.	75	11			147	64	136	9	
Eastport, Me.	113	33	4		489	50	90	290	2,259.00
Edenton, N. C.	21					21	65	31	82.24
Elizabeth City, N. C.	54	9			20	45	45	31	166.92
Erie, Pa.	110	5	1		51	105	207	23	630.10
Escanaba, Mich.	170	39	2		617	131	332		2,088.00
Eureka, Cal.	28	6		1	116	22	22		474.00
Fernandina, Fla.	20	6			44	14	26	3	435.35
Gallipolis Ohio.	10					10	21	1	300.00
Galveston, Tex.	188	56		2	671	132	286	36	1,455.83
Georgetown, S. C.	1,104	370	3	9	5,163	734	1,354	361	11,317.64
Gloucester, Mass.	134	9			55	125	148	7	750.00
Grand Haven, Mich.	225	26	3	1	354	199	296	55	1,401.37
Green Bay, Wis.	50	1			8	49	81	201	369.03
Gulftort, Miss.	47	11			101	36	48		618.84
Hancock, Mich.	55	6			38	49	77	30	213.24
Hartford, Conn.	3	1			1	2	4	1	332.85
Honolulu, Hawaii.	9	9		1	185			9	185.00
Hogquum, Wash.	627	170	5	9	3,191	457	975	91	6,939.10
Irrington, Va.	64	19			310	45	80	19	879.15
Jacksonville, Fla.	17					17	20		300.00
Juneau, Alaska.	306	145	3	5	1,627	161	276	204	5,241.68
Kansas City, Mo.	132	42	2	2	982	90	186	15	2,860.00
Ketchikan, Alaska.	95	37	1		235	58	150	13	816.83
La Crosse, Wis.	167	36	2	1	427	131	207	15	2,177.05
Little Rock, Ark.	21					21	32	22	364.00
Los Angeles, Cal.	347	2			18	345	379	1	208.00
Ludington, Mich.	489	184	1	8	4,309	305	394	284	16,000.79
Machias, Me.	115	26	1	3	389	89	246	68	1,226.65
Manistee, Mich.	48	10			125	38	69	24	478.78
Marquette, Mich.	33	11		2	184	22	36	112	681.90
Marquette, Mich.	108	48	2	2	606	60	120	23	1,264.22
Marshfield, Oreg.	68	8	2	1	80	60	60	45	493.50
Menominee, Mich.	32	10			96	22	44	5	673.50
Milwaukee, Wis.	22	4			73	18	43	5	457.05
Nantucket, Mass.	389	57	1	2	1,194	332	534	586	7,009.29
Nashville, Tenn.	18					18	18	11	300.00
Natchez, Miss.	47	3			24	44	110	21	359.80
New Bedford, Mass.	110	5			51	105	289	4	366.00
Newbern, N. C.	77	28	1		423	49	49	28	1,302.00
New Haven, Conn.	1,227	128	1		882	1,099	1,099	14	2,648.50
New London, Conn.	19	7			145	12	14	93	1,017.57
Newport, Ark.	220	131	8		2,255	89	89	103	6,587.74
Newport, Oreg.	122	9	1		54	113	170		573.80
Newport, R. I.	4					4	12		156.77
Newport News, Va.	112	47		5	513	65	80	10	1,009.50
	138	3			43	135	214	2	228.40



TABLE 2.—*Transactions at marine hospitals and other relief stations, fiscal year 1918—Continued.*

	Total number of patients treated.	Total number treated in hospital.	Died.	Remaining in hospital June 30, 1918.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically including pilots.	Amount expended.
<i>Second, third and fourth class stations—Contd.</i>									
Nome, Alaska.....	35	7	.....	.....	82	28	45	.....	\$371.60
Norfolk, Va.....	5,354	1,149	23	57	18,048	4,205	5,907	853	40,621.35
Ogdensburg, N. Y.....	81	15	.....	.....	423	66	147	1	1,089.25
Oswego, N. Y.....	2	2	.....	1	374	.....	.....	.....	1,157.75
Paducah, Ky.....	70	18	.....	.....	330	52	92	9	996.90
Pensacola, Fla.....	248	41	1	2	573	207	210	78	1,377.13
Perth Amboy, N. J.....	596	78	1	6	829	518	691	110	1,728.69
Philadelphia, Pa.....	1,867	453	18	18	5,749	1,414	3,389	1,501	21,641.53
Pittsburgh, Pa.....	692	197	14	8	3,987	495	955	164	11,771.19
Ponce, P. R.....	36	5	.....	.....	47	31	49	.....	60.00
Port Angeles, Wash.....	11	2	.....	.....	35	9	12	2	47.25
Port Arthur, Tex.....	250	48	3	.....	436	202	695	139	1,294.10
Port Huron, Mich.....	105	11	2	.....	264	94	273	184	561.27
Portland, Oreg.....	773	171	3	14	5,302	602	965	842	9,457.55
Portsmouth, N. H.....	8	2	.....	.....	32	6	9	77	89.59
Providence, R. I.....	368	175	5	3	2,888	193	262	722	7,677.78
Provincetown, Mass.....	112	.....	.....	.....	.....	112	424	44	890.90
Richmond, Va.....	607	10	.....	1	163	597	597	2	417.00
Rockland, Me.....	156	4	1	.....	21	152	336	145	541.25
St. Elizabeth's Hospital, Washington, D. C.....	94	94	8	74	25,285	.....	.....	.....	16,035.43
St. Paul, Minn.....	1	.....	.....	.....	.....	1	6	.....	.....
Saginaw, Mich.....	36	.....	.....	.....	.....	36	44	24	300.00
Salem, Mass.....	1	.....	.....	.....	.....	1	1	.....	1.00
San Diego, Cal.....	137	53	.....	.....	456	84	238	.....	3,736.22
Sandusky, Ohio.....	21	1	.....	.....	28	20	31	17	271.59
San Juan, P. R.....	523	75	2	4	1,166	448	449	477	2,623.06
Sault Ste. Marie, Mich.....	247	126	8	8	1,307	121	248	143	2,945.95
Seattle, Wash.....	2,195	515	20	3	3,973	1,680	3,864	1,684	13,533.62
Seward, Alaska.....	58	10	.....	.....	75	48	84	.....	859.50
Sheboygan, Wis.....	19	13	1	1	208	6	9	56	641.10
Solomons, Md.....	210	6	1	.....	47	204	253	.....	574.96
Superior, Wis.....	255	74	6	4	1,032	181	265	6	3,104.50
Tacoma, Wash.....	141	24	1	.....	273	117	117	121	1,559.55
Tampa, Fla.....	177	110	2	3	1,711	67	67	190	4,380.38
Toledo, Ohio.....	309	70	3	1	1,251	239	650	250	2,246.50
Unalaska, Alaska.....	13	3	.....	.....	92	10	10	.....	332.00
Valdez, Alaska.....	11	1	.....	.....	26	10	17	.....	663.10
Vicksburg, Miss.....	225	83	3	3	974	142	261	27	2,184.23
Washington, D. C.....	615	175	3	9	2,206	440	1,466	14	4,469.34
Washington, N. C.....	367	19	.....	.....	74	348	349	15	685.10
Wilmington, N. C.....	152	42	1	20	709	110	167	16	3,176.51
United States Coast Guard vessels.....	7,627	762	.....	.....	.....	6,865	17,820	153	.....
Keepers and surfmen, United States Coast Guard.....	2,132	628	.....	.....	2,077	1,505	3,935	393	.....
Quarantine stations.....	165	.....	.....	.....	.....	165	297	45	.....
Total.....	38,305	7,812	185	307	119,526	30,402	59,275	11,798	288,541.13
Of the above number relief was furnished as follows to:									
United States Army—									
Marine hospitals..	538	358	.....	.....	5,645	180	316	.....	.....
Relief stations.....	1,564	360	.....	.....	3,785	1,204	2,104	.....	.....
United States Navy—									
Marine hospitals..	1,371	1,080	.....	.....	17,156	291	496	.....	.....
Relief stations.....	1,347	323	.....	.....	4,681	1,024	1,539	.....	.....
War Risk Insurance—									
Marine hospitals..	173	162	.....	.....	1,744	11	13	.....	.....
Relief stations.....	19	9	.....	.....	93	10	24	.....	.....
United States Employees' Compensation Commission—									
Marine hospitals..	1,971	572	.....	.....	9,564	1,399	2,693	.....	.....
Relief stations.....	1,550	443	.....	.....	5,727	1,107	3,488	.....	.....
Total.....	8,533	3,307	.....	.....	48,395	5,226	10,673	.....	.....

NOTE.—Treatment by private physicians and a visit to a patient is counted as a day's treatment in hospital.

NOTE.—For summary of totals, see p. 321.



[illegible]

TABLE 3.—Summary of physical examinations made by officers of the United States Public Health Service during the fiscal year ended June 30, 1918, exclusive of immigrants—Continued.

Summary of examinations and rejections.	Causes of rejection—Continued.													Total.			
	Pilots.	Merchant seamen.	United States Coast Guard.	Post Office Department.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Civil Service Commission.	Philippine Islands.	Alaskan Engineering Commission.	Public Health Service.	United States Navy.	United States Army.	Bureau of Education.	United States Employees' Compensation Commission.	Bureau of War Risk Insurance.	United States Shipping Board.
Enlarged glands (unclassified).....	1							1									
Enlarged liver.....			1														
Enlarged lymph glands.....								1									
Enlarged heart and murmurs.....			1														
Enlarged rings.....						1		1				3					
Epididymitis, acute.....		1															
Epididymitis, chronic.....		1															
Epilepsy.....		1															
Facial paralysis.....			2														
Fever (unclassified).....			1														
Flat foot.....			1														
Flat foot, impaired lung, and pyorrhea.....		2	47	9				1				1					
Flat feet, dental plate, hyperidrosis.....		1															
Flat feet, dental plate, hyperidrosis.....																	
Fracture of bones of face.....			1														
Fracture of femur.....			1														
Fracture of skull.....			1														
General glandular enlargement.....		3															
Gonorrhea.....		1	3	1						1					2		
Gonorrhea.....			3														
Gonorrhea.....		15	12	7			9	1									
Gonorrhea.....		9	22					1									
Gonorrhea.....		33	3														
Gonorrhea.....			3														
Gonorrhea.....		1	15	12	7		9	1									
Gonorrhea.....			3														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														1
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														
Gonorrhea.....		38	23	11	3		6	3		8		2			4		1
Gonorrhea.....		1	4														





[illegible]

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
Abortion.....	1		1	1					
Abscess about rectum.....	75	2	33	16	15	1	1	2	40
Abscess about urethra.....	15		10	3	5	1		1	5
Abscess, alveolar.....	111	1	19	11	6	2		1	91
Abscess in male perineum.....	13	1	8	4	4			1	4
Unclassified.....	1								1
Abscess of:									
Axilla.....	71		8	4	3			1	63
Bone.....	20		4	1	3				16
Cartilage.....	2								2
Epididymis.....	1		4					1	1
Eye and annexa.....	20		4	4					16
Kidney.....	2		2		1			1	
Larynx.....	2								2
Liver.....	2		2	1	1				
Liver, endamoebic.....	7		2	1	1			1	5
Lung.....	6		5	2	1	1		1	1
Lymph nodes.....	89	1	12	7	5	1			76
Mammary gland.....	1								1
Muscle.....	41	1	3	1	2		1		37
Nasal septum.....	2								2
Ovary.....	1		1		1				
Pharynx.....	8		1	1					7
Prostate gland.....	1		1		1				
Salivary gland or duct.....	1		1	1					
Scrotum.....	7		6	4	2				1
Tendon sheath.....	14								14
Tongue.....	2	1		1					1
Abscess:									
Pelvic.....	1		1	1					
Pernephritic.....	7	1	4	5					2
Submammary.....	4		1		1				3
Subphrenic.....	5	1					1		4
Tonsillar.....	92		32	23	7	1		1	60
Otherwise unclassified.....	1,933	9	137	83	41	4		18	1,789
Acariasis.....	6		1	1					5
Achylia gastrica.....	39		2		2				37
Acidosis, nondiabetic.....	2								2
Acne.....	237		10	1	6	2		1	227
Acromegaly.....	1	1				1			
Actinomycosis.....	3	1			1				2
Adenoids.....	10		4	2	1	1			6
Adenoma.....	2		1	1					1
Adhesions about gall bladder.....	1		1		1				
Adhesions about stomach.....	4		1	1					3
Adhesions of peritoneum.....	27	1	14	4	5	3	1	2	12
Adhesions, preputial.....	2								2
Adhesions, otherwise unclassified.....	9		5		4		1		4
Ainhum.....	2								2
Albuminuria.....	26		5	3	1	1			21
Alopecia.....	4								4
Alopecia areata.....	6		2	2					4
Amaurosis.....	4		1		1				3
Amblyopia.....	6		2			1		1	4
Amenorrhea.....	1								1
Amoebiasis.....	3	1	2	1	1			1	
Amputation, stump.....	21		6	5		1			14
Amygdalitis, acute follicular.....	1,465	3	353	313	35			8	1,109
Amygdalitis, chronic.....	468	1	166	139	20	7		1	301
Anemia of brain (syncope).....	3		3	3					
Anemia, pernicious.....	19	1	10		7	1	1	2	8
Anemia, simple.....	85		3		1	1		1	82
Anemia, splenic.....	2	1	1		2				
Aneurysm.....	22	5	9	4	5	2	3		8
Aneurysm of heart.....	1								1
Aneurysm, varicose.....	21		21	20		1			
Angina pectoris.....	38	2	10	2	8	2			26
Angioma.....	40								40
Androsis.....	1		1						
Ankylosis of joint.....	28	1	14	4	6	2		3	13
Ankylosis of ossicles.....	1								1
Anthrax.....	5		2	2					3



TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
Anti-inoculation.....	1,381	.....	7	7	.....	.....	.....	.....	1,374
Aortitis.....	3	1	.....	.....	1	.....	.....	.....	2
Aphasia.....	4	1	2	.....	1	.....	.....	.....	1
Appendicitis, acute.....	253	20	163	148	17	1	7	11	70
Appendicitis, chronic.....	154	7	68	50	20	1	.....	4	79
Arterial sclerosis, cerebral.....	1	.....	.....	.....	.....	.....	.....	.....	1
Arterial sclerosis, general.....	189	7	43	.....	36	2	4	8	139
Arthritis, acute.....	171	.....	39	14	21	1	.....	3	132
Arthritis, chronic.....	111	1	45	8	29	3	.....	6	65
Arthritis deformans.....	14	9	5	.....	5	.....	1	8	.....
Artificial anus.....	1	.....	1	.....	1	.....	.....	.....	.....
Ascariasis.....	1	.....	.....	.....	.....	.....	.....	.....	1
Ascites, chylous, nonfilarial.....	4	.....	2	.....	1	1	.....	.....	2
Asthma.....	161	5	60	10	44	.....	.....	7	96
Astigmatism.....	21	.....	9	2	5	2	.....	.....	12
Atony of bladder.....	3	.....	.....	.....	.....	.....	.....	.....	3
Atony of stomach.....	10	.....	.....	.....	.....	.....	.....	.....	10
Atrophy of bone.....	1	.....	.....	.....	.....	.....	.....	.....	1
Atrophy of mammary gland.....	1	.....	.....	.....	.....	.....	.....	.....	1
Atrophy of muscle.....	15	.....	4	.....	2	.....	.....	2	11
Atrophy of optic nerve.....	4	2	1	.....	.....	2	.....	1	1
Atrophy of testicle.....	4	.....	.....	.....	.....	.....	.....	.....	4
Autointoxication, intestinal.....	760	1	148	128	18	.....	.....	3	611
Balanoposthitis.....	70	.....	7	3	4	.....	.....	.....	63
Balanitidis.....	1	.....	.....	.....	.....	.....	.....	.....	1
Beriberi.....	7	.....	2	1	1	.....	.....	.....	5
Blepharitis.....	27	.....	3	2	1	.....	.....	.....	24
Bradycardia.....	5	.....	.....	.....	.....	.....	.....	.....	5
Bromidrosis.....	5	.....	.....	.....	.....	.....	.....	.....	5
Bronchitis, acute.....	5,419	2	375	257	100	5	2	13	5,042
Bronchitis, chronic.....	521	4	88	20	60	2	.....	6	429
Bronchitis, fibrinous.....	1	.....	.....	.....	1	.....	.....	.....	.....
Bursitis, acute.....	116	1	17	8	8	2	.....	.....	98
Bursitis, chronic.....	49	4	12	5	10	.....	.....	1	37
Calculus in bladder.....	14	.....	7	4	3	.....	.....	.....	7
Calculus in ureter, impacted.....	6	.....	2	1	1	.....	.....	.....	4
Callositas.....	28	.....	2	2	.....	.....	.....	.....	26
Carbuncle.....	454	.....	42	20	16	1	.....	5	392
Carcinoma.....	115	4	53	6	12	17	19	3	58
Cardiospasm.....	4	.....	.....	.....	.....	.....	.....	.....	4
Caries of bone.....	3	2	1	.....	3	.....	.....	.....	.....
Caries of ossicles.....	9	.....	.....	.....	.....	.....	.....	.....	9
Caries of tooth.....	185	.....	4	1	.....	3	.....	.....	181
Caruncle of urethra.....	1	.....	.....	.....	.....	.....	.....	.....	1
Cataract.....	32	2	10	4	3	4	.....	1	20
Cellulitis.....	669	6	178	107	69	1	2	5	485
Cellulitis, pelvic.....	9	.....	.....	.....	.....	.....	.....	.....	9
Cerebrospinal fever.....	5	1	4	5	.....	.....	.....	.....	.....
Cerumen, accumulation of.....	282	.....	.....	.....	.....	.....	.....	.....	282
Chalazion.....	19	.....	2	1	.....	1	.....	.....	17
Chancroid.....	402	6	4	2	8	.....	.....	.....	392
Chancroid of penis.....	3,066	28	467	232	214	11	.....	38	2,571
Chancroid of vulva.....	1	.....	.....	.....	.....	.....	.....	.....	1
Chicken pox.....	9	.....	3	2	1	.....	.....	.....	6
Chilblain.....	9	.....	.....	.....	.....	.....	.....	.....	9
Chlorosis.....	1	.....	.....	.....	.....	.....	.....	.....	1
Cholangitis, acute.....	27	2	11	7	5	.....	.....	.....	14
Cholangitis, chronic.....	3	.....	2	1	1	.....	.....	.....	1
Cholecystitis, acute.....	38	.....	12	6	4	.....	1	1	26
Cholecystitis, chronic.....	32	1	3	2	2	.....	.....	.....	28
Cholelithiasis.....	34	1	6	2	5	.....	.....	.....	27
Chondritis.....	1	.....	1	.....	1	.....	.....	.....	.....
Chondroma.....	7	.....	2	2	.....	.....	.....	.....	5
Choro.ditis.....	6	1	2	.....	2	1	.....	.....	3
Chromidrosis.....	1	.....	.....	.....	.....	.....	.....	.....	1
Chyluria, nonfilarial.....	1	.....	.....	.....	.....	.....	.....	.....	1
Cicatricial contraction of skin.....	3	.....	3	.....	3	.....	.....	.....	.....
Cicatricial contraction.....	3	.....	2	.....	.....	1	.....	.....	1
Cicatrix of skin.....	3	.....	1	.....	1	1	.....	.....	.....
Cirrhosis of liver, atrophic.....	9	2	4	.....	5	.....	1	.....	3
Cirrhosis of liver, hypertrophic.....	15	1	12	.....	7	1	3	2	.....
Clavus (corn).....	68	.....	3	.....	2	1	.....	.....	65
Coccidiosis.....	1	.....	1	.....	.....	1	.....	.....	.....

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
Colitis, acute.....	57	1	16	8	9				40
Colitis, chronic.....	15		7	1	6				8
Color blindness.....	10		1		1				9
Comedo.....	3								3
Congestion of kidney.....	11		2	1	1				9
Congestion of lung, acute.....	14		4	3	1				10
Conjunctivitis, acute.....	480	1	40	27	12			2	439
Conjunctivitis, chronic.....	72		8		7	1			64
Conjunctivitis, phlyctenular.....	15		2	1	1				13
Constipation.....	2,006	5	50	35	17	2		1	1,951
Constitutional inferiority.....	3		3			3			
Contracture of joint.....	2		1	1					1
Contracture of muscle.....	10		3	2	1				7
Convulsions.....	2		2		2				
Cramp of ciliary muscle.....	1								1
Cramp of muscle.....	11		2	2					9
Cribbing (pneumophagia).....	2								2
Curvature of spine.....	4	1	2		2	1			1
Cyclitis.....	1								1
Cyst, brachial.....	1		1			1			
Cyst of brain.....	3								3
Cyst of retention.....	213	1	19	15	4			1	193
Cyst, otherwise unclassified.....	89		9	6	2			1	80
Cysticercosis.....	6								6
Cystitis, acute.....	267	1	33	21	12		1		233
Cystitis, chronic.....	190	3	19	4	13	2	1	2	168
Cystoma.....	4		1		1				3
Dacryocystitis.....	13		3		3				10
Deafness.....	12		2			2			10
Deformity of liver, acquired.....	4		4	2		1		1	
Deformity of nose, acquired.....	3								3
Deformity of penis, acquired.....	1	1		2		1			
Deformity, otherwise unclassified.....	5		3	2		1			2
Degeneration of muscle.....	4	1	2	1				2	1
Dementia ('cause unknown').....	12	1	8		5	3		1	3
Dementia precox.....	14	4	10			8		6	
Dementia precox, hebephrenia.....	1		1			1			
Dementia precox, paranoid form.....	4	4						4	
Dentition.....	2		1		1				1
Dermatitis exfoliativa.....	12		2						12
Dermatitis herpetiformis.....	4		2	2					2
Dermatitis medicamentosa.....	18		5	4	1				13
Dermatitis repens.....	27		1	1					26
Dermatitis traumatica.....	40		3		2			1	37
Dermatitis venenata.....	83		6	4	1			1	77
Dermatitis, otherwise unclassified.....	102		11	7	3			1	91
Detachment of retina.....	1		1			1			
Deviation of nasal septum.....	80		30	22	3	3		2	50
Diabetes insipidus.....	3		1		1				2
Diabetes mellitus.....	247	4	33		20	6	5	6	210
Diarrhea, flagellate.....	176		16	11	5				160
Dilatation, acute cardiac.....	8		6		2	1	3		2
Dilatation, chronic cardiac.....	6	1	1	1				1	4
Dilatation of stomach, chronic.....	4		1		1				3
Diphtheria.....	102	2	60	42	15		1	2	40
Diphtheria-bacillus carrier.....	2		2	2					
Dislocation of joint, congenital.....	1								1
Displacement, otherwise unclassified.....	2		1	1					1
Diverticulitis.....	1								1
Duodenitis.....	10		1	1					9
Dysentery, amebic.....	112	1	22	7	12			4	89
Dysentery, bacillary.....	24		5	3	1			1	19
Dysentery, otherwise unclassified.....	113	1	46	40	7				66
Dysmenorrhea.....	3								3
Echinococcosis.....	10		2	1				1	8
Ecthyma.....	1								1
Ectropion.....	1								1
Eczema.....	482		35	12	20	1		2	447
Eczema seborrhoicum.....	14								14
Edema of lung.....	1								1
Elephantiasis, nonfilarial.....	2		1		1				1

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Notim-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
Elephantiasis of scrotum, non-filarial	2		2			2			
Elongation of uvula	21		2	2					19
Embolism	2		2		2				
Emphysema, pulmonary inter-lobular	8		3		2			1	5
Emphysema, senile pulmonary	14		5		4	1			9
Endocarditis, acute	20	2	5		5	2			13
Endocarditis, chronic	45	1	13		7	1	2	4	31
Endometritis, chronic	4								4
Endothelioma	1	1				1			
Enlargement of prostate gland	44		11	1	3	2		3	33
Enteritis, acute	451	3	67	50	18		1	1	381
Enteritis, chronic	55		9	1	6		1	1	46
Enterocolitis	97		13	11	2				84
Entropion	1								1
Enuresis, functional	4		1		1				3
Epidemic meat poisoning	12		12	11	1				
Epididymitis, acute	118	1	40	23	17	1			77
Epididymitis, chronic	13		8	3	5				5
Epilepsy	79		31	5	19				48
Epilepsy, Jacksonian	7		2		1	1			5
Epiphora	5								5
Epiphysitis, acute	1								1
Epistaxis	21								21
Epithelioma	40	3	20	8	9	2		4	17
Erysipelas	60	2	32	28	4	1		1	26
Erythema multiforme	24		1		1				23
Erythema nodosum	6		1	1					5
Erythema simplex	21		2	1	1				19
Erythrasma	1								1
Exophthalmic goiter	10		5	2	1	1		1	5
Fatty heart	2								2
Fermentation, gastric	52		2	1	1				50
Fermentation, intestinal	81		5	5					76
Fever of unknown cause	29		26	19	4	2		1	3
Fibroma	11	1	5	5				1	5
Filariasis	1		1		1				
Fissure of anus	22		4	3	1				18
Fissure of nipple, puerperium	3								3
Fissure of skin	2								2
Fistula, biliary	2		2	1			1		
Fistula, fecal	6		1	1					5
Fistula in ano	175	1	49	24	21	1		4	125
Fistula of bladder	3	1					1		2
Fistula of urethra	11		3	1	1		1		8
Fistula, recto-urethral	6								6
Fistula, otherwise unclassified	4		2		2				2
Functional derangement of liver	366		27	15	10			2	324
Furunculosis	1,492	3	99	69	31			2	1,390
Ganglion	6		4	3	1				2
Gangrene	17		6	1	3	1	1		11
Gangrene, infective	7		4	2	1		1		3
Gangrene of lung	7								7
Gastritis, acute catarrhal	698		116	90	22	1	1	2	582
Gastritis, acute phlegmonous	55		3	2	1				52
Gastritis, chronic catarrhal	385	5	45	11	30	4	1	4	335
Gastroduodenitis	101	2	14	6	9	1			85
Gastroenteritis	224		70	62				2	154
Gastroptosis	5	1	3	2	1		1		1
General paralysis of the insane	6	4	2				3	3	
German measles	65		53	52	1				12
Gingivitis	39		3	1	2				36
Glaucoma, acute	2		2		2				
Glaucoma, chronic	6		3		1	1		1	3
Glossitis, acute	2		1	1					1
Glossitis, chronic	5								5
Glycosuria	2		1			1			1
Goiter	21		3	2		1			18
Gonocystitis, acute	8		1		1				7
Gonocystitis, chronic	1		1		1				

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Notim-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
Gonococcus infection of:									
Bladder.....	46		3	2				1	43
Cowper's gland.....	1								1
Endocardium.....	2								2
Endometrium.....	2								2
Epididymis.....	252	7	116	62	56	1		4	159
Eye.....	11	1	5	3	3				5
Fallopian tube.....	11		1		1				10
Joint.....	206	12	55	19	47			1	139
Lymph nodes.....	297	5	56	30	30			1	236
Pelvis of kidney.....	1		1				1		
Penis.....	1,694	1	41	12	28	2			1,652
Prostate gland.....	82	2	10	1	8			3	70
Seminal vesicle.....	23		1		1				22
Spermatic cord.....	1		1					1	
Testicle.....	137	1	52	26	24	2		1	84
Ureter.....	35								35
Urethra.....	7,045	32	799	252	494	12	1	72	6,214
Vagina.....	1								1
Otherwise unclassified.....	19		7	4	3				12
Gout, acute.....	6								6
Gout, chronic.....	23		5	2	3				18
Hallux valgus (bunion).....	26	2	6	5	3				18
Hammer toe.....	8		2	2					6
Hay fever.....	8								8
Headache.....	209		7	6		1			202
Heart block.....	3		2		2				1
Hematemesis.....	3								3
Hematocoele of spermatic cord.....	2		2	1	1				
Hematocoele, otherwise unclassified.....	1								1
Hematoma of vulva, nontraumatic.....	1								1
Hematoma, otherwise unclassified.....	5		3	1	1		1		2
Hematomyelia.....	1		1			1			
Hematuria, renal.....	23		3	1	1	1			20
Hemiplegia, old.....	55	21	18		10	2	6	21	16
Hemoglobinuria.....	2								2
Hemoptysis.....	7		3	2	1				4
Hemorrhage, intestinal.....	2		2	2					
Hemorrhage into cerebrum.....	73	14	30	2	18	4	5	15	29
Hemorrhage into retina.....	4		1					1	3
Hemorrhage, subdural.....	1								1
Hemorrhage under conjunctiva (nontraumatic).....	6								6
Hemorrhage, otherwise unclassified.....	17		10	4	4		1	1	7
Hemorrhoids, external.....	258		60	42	10	2		6	198
Hemorrhoids, internal.....	116	2	58	38	15	3		4	56
Hemorrhoids, mixed.....	102	3	38	27	11	1		2	61
Hemothorax.....	2								2
Hermaphroditism.....	1								1
Hernia:									
Diaphragmatic.....	2								2
Epigastric.....	1		1					1	
Epigastric, strangulated.....	2		2	1	1				
Femoral.....	21		7	6	1				14
Inguinal.....	1,080	18	469	369	56	27	1	34	593
Inguinal, strangulated.....	26	1	18	14	1		1	3	7
Into lesser peritoneal sac.....	2								2
Umbilical.....	27		10	5	1	4			17
Umbilical, strangulated.....	1								1
Ventral.....	19		9	8		1			16
Ventral, strangulated.....	1		1		1				
Otherwise unclassified.....	24		8	4	1	1	1	1	16
Herpes.....	130		4	2	2				120
Hiccough.....	2		1	1					1
Hodgkin's disease.....	7	1	5		3		2	1	1
Hordeolum.....	98		1	1					97
Hydrocele of round ligament.....	4								4
Hydrocele of spermatic cord.....	8		6	4	1			1	2
Hydrocele of tunica vaginalis.....	93	2	38	27	9	2		2	53

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Notim-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
Hydronephrosis	1								1
Hyperchlorhydria	11		8		7	1			3
Hyperchylia gastrica	3								3
Hyperemia of conjunctiva	1		1	1					
Hyperesthesia of retina	1		1	1					
Hyperidrosis	3								3
Hypermetropia	19		7	1	3	2		1	12
Hypernephroma	1		1				1		
Hypertrophy of:									
Bone	28		9	1	6			2	19
Clitoris	1								1
Heart	2		1		1				1
Lingual lymph node	1								1
Mammary gland	1								1
Tonsil	35		25	19	4			2	10
Hypochlorhydria	35		3		2			1	32
Hypochondriasis	8		1			1			7
Hysteria	24		9	3	1	5			15
Ichthyosis	1								1
Impacted feces	3		3	3					
Impetigo contagiosa	46		8	4	4				38
Impetigo simplex	17								17
Impotence	13								13
Incontinence of urine	56		2	1	1				54
Inflammation of salivary gland or duct	4		1	1					3
Inflammation of spermatic cord	1		1	1					
Infarct of kidney	2								2
Influenza	2,310	5	589	506	72	4		12	1,716
Ingrowing nail	108	2	24	13	11		1	1	82
Insanity, variety not ascertained	20	2	13		7	8			5
Insomnia	32		1	1					31
Insufficiency of ocular muscle	1		1		1				
Intestigo	6								6
Iridocyclitis	10		8	1	4	1		2	2
Iritis	80	1	23	9	10	1		4	56
Jaundice, acute infective	70	1	26	19	7	1			43
Keratitis	28		12	2	10				16
Keratitis, phlyctenular	5								5
Keratosis	1		1	1					
Laceration of cervix uteri, old	1	1		1					
Laryngitis, acute	280		46	36	9	1			234
Laryngitis, chronic	63		5		1	4			58
Leprosy	1	1						1	
Lukemia	4		4	1	1	1	1		
Lukodermia	2								2
Lishen planus	4								4
Lipoma	40	1	8	9					31
Lymphadenitis, acute	1,179	27	284	130	150	11		20	868
Lymphadenitis, chronic	67	1	18	6	9	2	1	1	48
Lymphangiectasis	1		1	1					1
Lymphangitis of puerperium	1								
Lymphangitis	40		17	10	6				23
Malaria, estivo-autumnal	217	2	114	60	47	2		7	101
Malaria, quartan	90		28	24	2	1		1	62
Malaria, tertian	1,480	12	429	327	95	5		14	1,039
Malformation of (congenital):									
Appendix	1								1
Foot	2	1	1	1		1			
Hand	1		1		1				
Nervous system	3		3	2		1			
Penis	2	1	1	1		1			
Testicle	1		1	1					
Urethra	3		1		1				2
Malingering	66		30	7	1	22			36
Malnutrition	31								31
Mastitis, chronic	2								2
Mastoiditis, acute	23		12	8	2	1	1		11
Mastoiditis, chronic	6		4	2	1	1			2
Masturbation	1								1
Measles	376	10	230	222	14			4	136
Melancholia, involutional	13	4	7	5	3		1	2	2
Meniere's disease	1								1

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-pro cd.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
Meningitis, cerebral.....	1		1				1		
Meningitis, cerebrospinal.....	16	2	14	4	7		3	2	
Meningitis, spinal.....	2		2		1	1			
Menopause.....	1								1
Menorrhagia.....	1		1		1				
Metatarsalgia.....	3								3
Meningococcus carrier.....	11		11	11					
Metrorrhagia.....	3								3
Migrane.....	38		1			1			37
Malaria.....	18		1	1					17
Morvan's disease.....	1								1
Mumps.....	350	3	224	202	19			6	123
Mycetoma.....	1		1		1				1
Myelitis, disseminated.....	9								9
Myelitis, transverse.....	1								1
Myocarditis, acute.....	15	1	6	1	3		1	1	8
Myocarditis, chronic.....	88	3	40		28	5	7	3	45
Myopia.....	10								10
Myositis, acute.....	69	1	9	7	3				68
Myositis, chronic.....	15		5	3	1	1			10
Myotonia, congenital.....	6								6
Myringitis, acute.....	7		5	1	4				2
Myringitis, chronic.....	6		1		1				5
Necrosis of bone.....	63	3	26	8	19	1		1	34
Necrosis of cartilage.....	1		1		1				
Nematodiasis, otherwise un-classified.....	1		1	1					
Nephralgia.....	21								21
Nephritis, acute.....	193	1	38	6	20		6	7	154
Nephritis, chronic, interstitial.....	250	11	65	4	43	1	16	12	174
Nephritis, chronic, parenchymatous.....	103	8	64		39	6	14	13	31
Nephritis, disseminated, sup-purative.....	8		1				1		7
Nephrolithiasis.....	11		11	5	5			1	1
Nephroposis.....	2				1				
Nervous dyspepsia.....	28	1	2	2		1			25
Neuralgia.....	267	2	44	23	21			2	221
Neurasthenia.....	439	1	42	7	31	4		1	396
Neuritis, multiple.....	63	1	6	1	3	2		1	56
Neuritis.....	245	3	74	32	34	4		7	168
Neuritis, optic.....	26		7		6			1	19
Neurosis, intestinal.....	34		2		1			1	32
Neurosis, occupational.....	1		1	1					
Neurosis of bladder.....	5								5
Neurosis of larynx.....	1		1	1					
Neurosis of mammary gland.....	3								3
Neurosis, traumatic.....	7		3	1	2				4
Nevus.....	4		1	1					3
Nostalgia.....	2								2
Obesity.....	9	1	1		1			1	7
Obstruction, acute, intestinal.....	13		6	4	1			1	7
Obstruction, chronic, intestinal.....	3		2	1			1		1
Obstruction of pancreatic duct.....	2								2
Onychia.....	3								3
Oncchia.....	78		3	2				1	75
Oophoritis, chronic.....	2								2
Opacity of cornea.....	3								3
Opacity of vitreous humor.....	1		1	1					1
Orchitis, acute.....	125		33	18	14	1			92
Orchitis, chronic.....	25		5	4	1				20
Osteitis deformans.....	5								5
Osteomalacia.....	7								7
Osteoma.....	18		3	1	2				15
Osteomyelitis, acute.....	42		9	1	6		1	1	33
Osteomyelitis, chronic.....	52	1	21	4	14	2		2	30
Otitis externa.....	70		5	4	1				65
Otitis interna, acute.....	21		3	2	1				18
Otitis interna, chronic.....	5		1		1				4
Otitis media, acute.....	156	1	42	25	14	1	2	1	113
Otitis media, chronic.....	242	4	40	6	30	5		3	198
Oxuriasis.....	95		1	1					94
Ozena.....	4		1		1				3

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from previous year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
Palpitation, cardiac.....	3		3	1	1	1			
Pancreatitis, acute.....	3								3
Pancreatitis, chronic.....	5	1		1					4
Panophthalmitis.....	3		3	1	2				
Papilloma.....	87		11	5	6				76
Pappataci fever.....	2								2
Paragonimiasis.....	10								10
Paralysis, acute ascending.....	1		1		1				
Paralysis agitans.....	6	1	3		1	1		2	2
Paralysis, infantile spastic.....	1	1						1	
Paralysis of muscle, ischemic.....	8	1	3		2	1		1	4
Paralysis of nerve.....	22		6	1	1	4			16
Paralysis of ocular muscle.....	18								18
Paralysis of spinal nerve.....	3								3
Paraphimosis.....	48	1	9	3	5			2	38
Paraplegia, ataxia.....	9	2	5		3			2	2
Paraplegia, hereditary spastic.....	3	1	2		2	2		1	
Paronychia.....	51		2		2				49
Pediculosis.....	83		3	2	1				80
Pellagra.....	32	1	4	1	4				27
Perforated nasal septum.....	1								1
Pericarditis.....	4	1	3	1	2		1		
Periostitis, acute.....	103	1	18	13	5			1	84
Periostitis, chronic.....	14		6		5	1			8
Peritonitis, acute, general.....	4		3	1			1	1	1
Peritonitis, acute, local.....	3		3	1	1				
Peritonitis, chronic, general.....	1		1		1				
Peritonitis, chronic, local.....	1		1		1				
Perversion of appetite.....	8								8
Pes cavus (hollow foot).....	2								2
Pes planus (flat foot).....	87	3	21	1	16	7			63
Pes valgus.....	1								1
Pharyngitis, acute.....	950	1	92	79	12	1		1	857
Pharyngitis, chronic.....	116		9	2	5	2			107
Phimosis.....	202	1	68	47	12	3		7	133
Phlebitis.....	33		12	6	6				21
Piedra.....	2								2
Pinta.....	1								1
Pityriasis rosea.....	7								7
Pityriasis versicolor.....	7								7
Pleurisy, acute fibrinous.....	245	5	82	64	18	3	1	1	158
Pleurisy, chronic fibrinous.....	77	3	16	4	14	1			58
Pleurisy, serofibrinous.....	42	3	25	9	15	1		3	14
Pleurisy, suppurative.....	15	1	12	3	3		1	6	2
Pleuritic adhesions.....	20		7	1	4		1	1	13
Pneumonia, broncho.....	104	2	57	38	10		9	2	45
Pneumonia, interstitial.....	3		3	1	1				
Pneumonia, lobar.....	350	7	284	160	38	2	79	12	59
Poliomylitis, acute bulbar.....	3		3	1			1		
Polycythemia, chronic.....	1								1
Polypus, nasal.....	34	1	6	6	1				27
Pregnancy.....	1								1
Prepuce, redundant.....	72	1	41	32	3	3		4	30
Fresbyopia.....	4		1		1				3
Proctalga.....	1								1
Proctitis.....	18		1		1				17
Prolapse of rectum.....	10		5	4	1				5
Prostatitis, acute.....	9	1		1					8
Prostatitis, chronic.....	85		17	1	16				68
Protozoa infection, otherwise unclassified.....	1								1
Prurigo.....	3								3
Pruritus.....	25		1	1					24
Pruritus ani.....	28		2	1	1				26
Psoriasis.....	87	1	7	2	5	1			97
Psychasthenia.....	29	1	8	1	6	2			20
Psychosis due to organic brain disease.....	1		1			1			
Psychosis, epileptic.....	2	1	1	1				1	
Psychosis, hysterical.....	6		3	1	1	1			3
Psychosis, intoxication.....	41	2	21	8	10	3		2	18
Psychosis, manic depressive.....	9	4	2			1		5	3
Psychosis, senile.....	6	1				1			5
Psychosis, traumatic.....	1		1			1			

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
Pterygium.....	34	2	6	2	4	2			26
Puerperium.....	1								1
Purpura.....	5		3		2			1	2
Pyelitis.....	9	1	6	1	6				2
Pyelonephritis.....	1		1	1					
Pylospasm.....	6								6
Pyonephrosis.....	5		3	2				1	2
Pyopneumothorax.....	2		2		2				
Pyorrhoea alveolaris.....	98	1	6	2	5				91
Raynaud's disease.....	1		1					1	
Regurgitation from stomach.....	1	1					1		
Retention of urine.....	22		5	2	3				17
Rhinitis.....	13		1		1				12
Rheumatic fever, acute.....	255	13	111	85	31	1	3	4	131
Rheumatic fever, subacute.....	102	3	39	23	15	1	1	2	60
Rheumatism, chronic articular.....	599	15	127	53	79	3		7	457
Rheumatism, muscular.....	2,730	13	270	134	123	9		17	2,447
Rhinitis, acute.....	611		28	21	6	1			583
Rhinitis, atrophic.....	48		3			1	1	1	45
Rhinitis, hypertrophic.....	108		6	3	1	2			102
Rhinolith.....	2								2
Rhinoscleroma.....	2								2
Salpingitis, acute.....	3		2		2				1
Salpingitis, chronic.....	7		3	2	1				4
Salpingitis, Eustachian, acute.....	10								10
Sarcoma.....	13		8	1	1	1	2	3	5
Sarcopsylliasis.....	1								1
Scabies, Norwegian.....	156		14	9	4			1	142
Scabies, sarcoptic.....	426		39	26	10	1		2	387
Scarlet fever.....	30	1	25	17	8			1	4
Scleritis.....	1								1
Scleroderma.....	1		1	1					
Sclerosis, disseminated.....	11		3		2	1			8
Sclerosis, lateral.....	5	2	1					3	2
Sclerosis, otherwise unclassified.....	4								4
Scurvy.....	10								10
Seborrhea.....	16		2	1	1				14
Seminal emissions.....	4								4
Senility.....	16	3	7		3	5	1	1	6
Septicemia.....	45	1	24	13	4		5	3	20
Shock.....	6		2		1		1		4
Sinusitis, ethmoidal.....	8		3	2	1				5
Sinusitis, frontal.....	36		12	5	6	1			24
Sinusitis, maxillary.....	11		5	2	2			1	6
Sinus.....	12	1	9	7	3				2
Smallpox.....	65	3	18	18	1	1		1	44
Spasm, nodding.....	1								1
Spermatorrhoea.....	12		1			1			11
Splenitis, acute.....	1								1
Sporotrichosis.....	3		1		1				2
Sea sickness.....	54		6	6					48
Sprue (psilosis).....	4		2			1	1		2
Stenosis of larynx.....	1								1
Stenosis of punctum lacrimale.....	5								5
Stomatitis.....	66		2		2				64
Stomatitis, gangrenous.....	6		1		1				5
Stricture of esophagus.....	2		2		1			1	
Stricture of rectum.....	1		1		1				
Stricture of ureter.....	6								6
Stricture of urethra.....	312	3	70	17	50	2	1	3	239
Sudamina.....	12		1	1					11
Synovitis, acute.....	77	1	26	12	13	1		1	50
Synovitis, chronic.....	42	2	9	3	6	1		1	31
Syphilis of:									
Blood vessel.....	15		7		5	1	1		8
Anus.....	5		4		4				1
Bone.....	18		13		12			1	5
Brain.....	43	1	19		11	4	1	4	23
Cerebral meninges.....	3		3		3				
Cerebrospinal meninges.....	8	1	4		4	1			3
Epididymis.....	1								1
Eye and annexa.....	33	3	16	1	15	2		1	14
Heart.....	6	1	1		2				4



TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
Syphilis of—Continued.									
Intestine.....	5		2	1	1				3
Joint.....	17	1	8		9				8
Larynx.....	22		11		10		1		11
Lip.....	14	1	1		2				12
Liver.....	12		9		7		1	1	3
Lung.....	4		3		3				1
Lymph nodes.....	275	1	72	1	68	1		3	202
Mouth.....	62		20		20				42
Muscle.....	17		4		4				13
Nasal passage.....	39	1	9		10				29
Palate.....	12		2		2				10
Pancreas.....	1		1		1				
Penis.....	877	15	269	15	238	4		27	593
Pharynx.....	104	1	10	1	10				93
Rectum.....	7		3		3				4
Scrotum.....	7		1		1				6
Skin.....	1,125	11	367	15	343	5		15	747
Spermatic cord.....	2								2
Spinal cord.....	20	5	8		6	2		5	7
Spinal meninges.....	1		1		1				
Spinal nerve.....	6		2		2				4
Stomach.....	9		7		7				2
Tendon sheath.....	27								27
Tongue.....	66	1	8		7	1		1	57
Tonsil.....	34	1	28	1	28				5
Testicle.....	9	1	8	1	8				
Urethra.....	2		1			1			1
Uvula.....	5		1		1				5
Otherwise unclassified.....	4,803	18	1,162	24	1,080	41	6	29	3,623
Syringomyelia.....	1	1						1	
Tabes dorsalis.....	107	31	32		26	7	2	28	44
Tachycardia.....	17	1	2		3				14
Taeniasis.....	38		9	6	3				29
Tenosynovitis.....	37		5	2	2	1			32
Teratoma.....	13	1			1				12
Thrombosis.....	16	1	13	2	10		2		2
Torsion of spermatic cord, non-traumatic.....	1								1
Tracheitis.....	39		4	4					35
Trachoma.....	109		48	31	4	2		11	61
Trichiasis.....	4								4
Trichiniasis.....	1								1
Trichophytosis.....	117		10	4	4	1		1	107
Tuberculosis:									
Acute broncho-pneumonic.....	3		1		1				2
Acute general.....	5		1		1				4
Acute pneumonic.....	10	2	8		5		4		
Acute pulmonary miliary.....	138		28	1	9	4	10	4	110
Chronic pulmonary.....	1,115	291	632	62	285	131	131	314	192
Tuberculosis of:									
Appendix.....	1		1				1		
Bone.....	18	2	11		10			3	5
Bronchus.....	3								3
Bursa.....	1		1		1				
Cerebrospinal meninges.....	1		1				1		
Epididymis.....	3	1	2	1	2				
Intestine.....	2		2		1		1		
Joint.....	24	5	10		8		1	6	9
Kidney.....	2		2		1	1			
Larynx.....	7		4		1	1	2		
Lymph nodes.....	32	1	13	4	8			2	18
Mammary gland.....	1								1
Peritoneum.....	4		4				4		
Pharynx.....	1		1				1		
Pleura.....	2		2		1		1		
Prostate gland.....	2		1		1				1
Rectum.....	1		1		1				
Spinal cord.....	1								1
Testicle.....	10		2		2				8
Otherwise unclassified.....	7		7	1	4	1	1		
Tuberculous abscess of bone.....	1								1
Tuberculous abscess of vertebra.....	8	1	3		1	1		2	4

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and Injuries.	Total treated in hospital and dispensary.	Re-maining in hospital from previous year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-maining in hospital at close of year.	Treated at dispensary.
Tuberculous abscess, otherwise unclassified.....	2		2		1		1		
Tumors, mixed, benign.....	63		9	3	2	1	1	2	54
Tumors, mixed, malignant.....	13	1	6		2	2	2	1	6
Typhoid bacillus carrier.....	1	1						1	
Typhoid fever.....	240	14	182	124	16	3	23	30	44
Typhus fever.....	1		1	1					
Ulcer of duodenum.....	27		13	2	3	4	1	3	14
Ulcer of duodenum, perforating..	1		1	1					
Ulcer epiglottis.....	1								1
Ulcer of:									
Eye and annexa.....	103	3	21	10	13	1			79
Mouth.....	61		3	3					58
Nasal passage.....	13								13
Rectum.....	8		1		1				7
Skin.....	1,171	10	121	47	66	3		15	1,040
Skin, varicose.....	246	6	53	20	31	1		7	187
Stomach.....	106	3	48	20	22	5		4	55
Stomach, perforating.....	5		3				2	1	2
Trachea.....	3								3
Ulcer, phagedenic.....	13		3	1	1			1	10
Uncinariasis.....	15		15	10	4			1	
Union of bone, faulty.....	9	3	6		5	1		3	
Ureteral colic.....	12	1	7	3	5				4
Urethritis.....	9								9
Urethral fever, traumatic.....	2		1	1					1
Urethritis, acute.....	81		8	4	4				73
Urethritis, chronic.....	61		4		3	1			57
Urticaria.....	106	1	13	11	3				92
Vaccinia.....	484	2	52	44	9	1			430
Valvular disease, chronic cardiac.	450	25	129	3	137	13	48	23	296
Varicocele.....	187	1	73	52	13	3		6	113
Varix.....	210	8	81	45	32	6		6	121
Varix of esophagus.....	10		1		1				9
Vertigo.....	16		4	1	2	1			12
Vincent's angina.....	11		10	9	1				1
Vomiting of pregnancy.....	2								2
Vomiting, recurrent.....	8								8
Wart.....	186		20	15	4			1	166
Whooping cough.....	1		1					1	
Zoster.....	44		8	6	2				36
<i>Affections due to Poisonings and Intoxications.</i>									
Alcohol poisoning.....	213	1	117	82	30	4	1	1	95
Cocaine poisoning, acute.....	2		1			1			1
Fish poisoning.....	11		1	1					10
Alum poisoning.....	1								1
Ammonia poisoning, acute.....	6		2	2					4
Ammonia poisoning, industrial..	1		1	1					
Botulism.....	1		1	1					
Cocaine poisoning, chronic.....	1		1		1				
Coffee poisoning.....	1		1		1				
Copaiba poisoning.....	3		1	1					2
Creatoxismus.....	24		18		14	4			6
Cyanide poisoning, industrial.....	2		2	1	1				
Gasoline poisoning.....	3		1		1				2
Gasoline poisoning, industrial.....	2		2		2				
Illuminating-gas poisoning.....	1		1	1					
Arseniferretted hydrogen poison-ing, industrial.....	4								4
Aniline poisoning, industrial.....	2								2
Insect sting.....	35		4	2	1				31
Lead poisoning, acute.....	6		1			1			5
Lead poisoning, industrial.....	2		1		1				1
Mercury poisoning, acute.....	25		5	2	2		1		20
Milk poisoning.....	1		1	1					
Morphine poisoning.....	15	1	5		4	1			9
Opium poisoning, chronic.....	2		2		1	1			
Petroleum poisoning.....	2		1	1					1
Phenol poisoning.....	4		2	2					2

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
<i>Injuries (wounds, etc.).</i>									
Abrasion of:									
Abdominal wall.....	1								1
Anus.....	1								1
Arm.....	45		1		1				44
Back.....	5								5
Bladder.....	1								1
Buttock.....	1								1
Chest wall.....	10		2	2					8
External ear.....	2								2
Eye.....	6								6
Eyelid.....	5								5
Face.....	14		3	1	2				11
Finger.....	143		2	1	1				141
Foot.....	239		5	4	1				234
Forearm.....	23		1	1					22
Gum.....	2								2
Hand.....	131		7	4	3				124
Leg.....	198	2	16	6	9	1	1	1	180
Lip.....	6								6
Mouth.....	7								7
Neck.....	12		1	1					11
Nose.....	1								1
Penis.....	26		2	2					22
Perineum.....	1								1
Pharynx.....	8								8
Rectum.....	7		1	1					6
Scalp.....	11		1		1				10
Scrotum.....	1								1
Shoulder.....	7		2	1	1				5
Thigh.....	15		1	1					14
Toe.....	80								80
Serum poisoning.....	2		2	2					
Shell-fish poisoning.....	6		1	1					5
Tobacco poisoning, chronic.....	7		1		1				6
Zinc poisoning.....	1		1	1					
Poisoning otherwise unclassified.....	12		9	8	1				3
Veronal poisoning.....	6								6
Otherwise unclassified.....	50		2	1	1				48
Abrasions, multiple.....	2		1		1				1
Avulsion of:									
Arm, complete.....	7		2	1	1				5
Arm, partial.....	1		1					1	
Finger, complete.....	220		11	3	6			2	209
Finger, partial.....	25		9	1	6				16
Finger nail.....	32								32
Foot, partial.....	2		2	1				1	
Forearm, partial.....	1		1	1					
Leg, complete.....	1		1	1					
Leg, partial.....	1		1	1					
Shoulder, partial.....	1								1
Toe, complete.....	3		3	1	2				
Toenail.....	9								9
Burn of:									
Abdominal wall.....	14	1	4	4	1				9
Arm.....	397		34	20	11			3	363
Back.....	35		8	2	4			2	27
Breast.....	7		4	2	2				3
Buttock.....	2		1	1					1
Chest wall.....	17		5	2	2		1		12
External ear.....	1								1
Eye.....	22		4	2	2				18
Eyelid.....	7		1	1					6
Face.....	88		28	17	8		2	1	60
Finger.....	52		1		1				51
Foot.....	209		33	15	15			3	176
Forearm.....	104		9	4	3			2	95
Hand.....	369		24	11	11			2	345
Leg.....	187	2	21	13	7			3	154
Lip.....	4								4
Mouth.....	1		1	1					
Neck.....	8		2		2				6

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
<i>Injuries (wounds, etc.)—Contd.</i>									
<b>Burn of—continued:</b>									
Nose.....	5								5
Penis.....	15		1					1	14
Pharynx.....	3		1	1					2
Scalp.....	3		1		1				2
Scrotum.....	2		1	1					1
Shoulder.....	43	1	4	2	2				38
Thigh.....	18		7	6	1				11
Toe.....	2								2
Otherwise unclassified.....	19		3	1	1			1	16
Burns, multiple.....	86		41	8	20	1	9	3	45
Castration, traumatic.....	1		1	1					
Compression of nerve.....	3		3		2	1			
<b>Contusion of:</b>									
Abdominal wall.....	50	1	15	11	3	1	1		34
Arm.....	130		18	9	7		1	1	112
Anus.....	2		2	1	1				
Back.....	242	3	59	28	30	30		4	180
Bone.....	36	2	11	4	6			1	23
Breast.....	10		1	1					9
Buttock.....	20		7	2	5				13
Chest wall.....	378		74	46	26			2	304
External ear.....	5		1		1				4
Eyeball.....	51		12	3	9				39
Eyelid.....	13		2	1	1				11
Face.....	73	1	14	10	4	1			58
Finger.....	540		24	14	10				516
Foot.....	521	1	129	67	54	5		4	391
Forearm.....	98		21	8	11	2			77
Hand.....	341	1	24	7	14	1		3	316
Intestine.....	1		1		1				
Joint.....	283		81	38	40			3	202
Kidney.....	3		2		2				1
Leg.....	413	3	74	40	31	2		4	336
Lip.....	10								10
Mesentery.....	1								1
Mouth.....	2								2
Muscle.....	19		5	5					14
Neck.....	27		8	6	1		1		19
Nerve.....	3		1		1				2
Nose.....	11								11
Penis.....	10		3	2				1	7
Perineum.....	6		3	1	1			1	3
Peritoneum.....	1		1	1					
Scalp.....	53		15	7	6			2	38
Scrotum.....	6		2	1	1				4
Shoulder.....	164	2	32	13	19	1		1	130
Testicle.....	54	1	14	9	5	1			39
Thigh.....	74		13	7	4	1		1	61
Toe.....	162		20	11	9				142
Tongue.....	2		1	1					1
Uterus.....	2								2
Uvula.....	1								1
Otherwise unclassified.....	64		19	13	6				45
Contusions, multiple.....	77	1	21	14	7	1			55
<b>Crush of:</b>									
Arm.....	3		2	1	1				1
Buttock.....	2		2		2				
Finger.....	207		17	5	12				190
Foot.....	29		9	4	4	1			20
Forearm.....	17								17
Hand.....	11		11	3	6			2	
Leg.....	2	1	1	1	1				
Thigh.....	8		1	1					7
Toe.....	58		10	4	5			1	48
Dislocation about wrist.....	12								12
<b>Dislocation of:</b>									
Ankle.....	4		2	1		1			2
Clavicle.....	22		4	1	3				18
Costal cartilage.....	10		1		1				9
Elbow.....	2		1	1					1

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
<i>Injuries (wounds, etc.)—Contd.</i>									
Dislocation of—continued:									
Finger.....	48		4	3	1				4
Hip.....	2		2	1	1				
Intra-articular cartilage of joint.....	7	2	4	1	4			1	1
Knee.....	5		4	1	2			1	1
Maxilla, inferior.....	1		1	1					
Metacarpus.....	5		1	1					4
Nasal cartilage.....	1								1
Patella.....	1		1	1					
Shoulder.....	75		33	17	12			4	42
Targus.....	2								2
Thumb.....	33		2		2				31
Toe.....	1		1	1					
Vertebra.....	1		1				1		
Wrist.....	4		1		1				3
Otherwise unclassified.....	6		1		1				5
Drowning.....	2		1					1	1
Electric shock, injury from.....	1								1
Epiphyseal separation of bone, traumatic.....	1		1		1				
Exhaustion from overexertion and exposure.....	22	2	4	5	1				20
Exposure to extreme cold.....	10		1		1				9
Foreign body in:									
Arm.....	6		1	1					5
Auditory canal.....	18								18
Bone.....	1								1
Chest wall.....	1		1	1					
Esophagus.....	2								2
Eye.....	320		15	8	6	1			305
Face.....	3								3
Finger.....	59		4	1	3				55
Foot.....	11		2	1	1				9
Forearm.....	13		1		1				12
Gum.....	1								1
Hand.....	55		8	5	3				47
Joint.....	3		2	1	1				1
Larynx.....	2								2
Leg.....	7		1	1					6
Liver.....	2		2		1	1			
Maxillary sinus.....	4								4
Nasal passage.....	1								1
Pharynx.....	2								2
Pleural cavity.....	1		1	1					
Scalp.....	1								1
Stomach.....	1		1	1					
Toe.....	1								1
Trachea.....	3								3
Otherwise unclassified.....	4		1	1					3
Fracture about ankle joint, compound.....	9		8	2	4			2	1
Fracture about ankle joint, simple.....	86	5	43	20	23			5	38
Fracture about wrist joint, compound.....	25		3		2			1	22
Fracture about wrist joint, simple.....	112		27	9	12	4		2	85
Fracture of:									
Bones of face, compound.....	10		8	1	6			1	2
Bones of face, simple.....	21		6	1	5				15
Bones of foot, compound.....	36		13	4	7			2	23
Bones of foot, simple.....	154	4	75	30	41	3		5	75
Bones of forearm, compound.....	25		15	7	6			2	10
Bones of forearm, simple.....	358	2	66	26	37		1	4	290
Bones of hand, compound.....	182	1	31	11	20			1	150
Bones of hand, simple.....	195	1	36	16	16	2		3	158
Bones of leg, compound.....	54	7	32	12	15	2	2	8	15
Bones of leg, simple.....	227	10	93	53	35	2		13	124
Clavicle, compound.....	1								1
Clavicle, simple.....	71	1	32	14	12			7	38
Coccyx.....	1		1					1	

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
<i>Injuries (wounds, etc.)—Contd.</i>									
Fracture of—Continued.									
Costal cartilage, compound..	1		1		1				
Costal cartilage, simple..	3		1					1	2
Femur, compound.....	19		6		2	1		3	13
Femur, simple.....	58	7	43	19	15	5	5	11	8
Humerus, compound.....	9		4	2	1			1	5
Humerus, simple.....	83	1	23	8	11	1		4	59
Inferior maxilla, compound..	23		15	7	5	1		2	8
Inferior maxilla, simple.....	22		16	8	6	2			6
Nasal septum.....	11		6	1	4			1	5
Patella, simple.....	30	2	16	8	8			2	3
Pelvis, compound.....	4		1	1					1
Pelvis, simple.....	12	3	9	6	5			1	
Rib, compound.....	5		2	2					3
Rib, simple.....	222	1	74	35	37			3	147
Sacrum, simple.....	1		1		1				
Scapula, simple.....	9		3	1	1			1	6
Skull, compound.....	5	1	4	1	2		2		
Skull, simple.....	17		14	2	6	1	4	1	3
Sternum, simple.....	3		1		1				2
Vertebra, compound.....	2	1						1	1
Vertebra, simple.....	20	4	11	1	5		6	3	5
Otherwise unclassified, com-pound.....	4		4	2	1		1		
Otherwise unclassified, sim-ple.....	33		4		4				29
Fracture of penis.....	1								1
Frostbite of:									
External ear.....	45		5	1	4				40
Finger.....	57		5	5					52
Foot.....	28		14	6	5	2	1		14
Hand.....	12		9	8	1				3
Toe.....	12		4	3	1				8
Otherwise unclassified.....	3								3
Heat cramps.....	15		8	8					7
Heat exhaustion.....	19		14	11	1	1		1	5
Hematoma of:									
Arm.....	3		2	2					1
Back.....	2		1					1	1
Buttock.....	2		2	2					
Finger.....	1								1
Foot.....	1								1
Hand.....	1								1
Leg.....	6		2	2					4
Neck.....	1								1
Scrotum.....	2		1	1					1
Shoulder.....	1								1
Toe.....	4								4
Hematoma, otherwise unclassi-fied.....	1								1
Hemorrhage into eyeball.....	2		2		1	1			
Hemorrhage under conjunctiva, traumatic.....	3								3
Intracranial injury.....	55	1	37	23	10	1	3	1	17
Intraspinal injury.....	37		4		1	2		1	33
Multiple injuries, extreme.....	4		3		1	1	1		1
Operation wound.....	277		16	6	7	2	1		261
Rupture of:									
Ligaments.....	12								12
Muscle.....	10		2		2				8
Nerve.....	1		1		1				
Tendon.....	1								1
Tympanum, traumatic.....	4								4
Otherwise unclassified.....	19	1	2	1	1			1	16
Sprain of:									
Ankle.....	472	6	142	67	73	3		5	324
Back.....	284	2	61	33	26	3		1	221
Elbow.....	26	1	9	6	3			1	16
Finger.....	41		1		1				40
Hand.....	43		2		2				41

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-main-ing in hos-pital from pre-vious year.	Ad-mitted during the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-main-ing in hos-pital at close of year.	Treated at dis-pens-ary.
<i>Injuries (wounds, etc.)—Contd.</i>									
Sprain of—Continued.									
Hip.....	38		9	4	5				29
Joint.....	80		23	11	8	3		1	57
Knee.....	144	2	39	20	19	1		1	103
Shoulder.....	86		15	5	9			1	71
Tendon.....	37		3	1	2				34
Thumb.....	32		6	4	1	1			26
Toe.....	14		1		1				13
Wrist.....	259		21	12	7	1		1	238
Otherwise unclassified.....	53		6	4	2				47
Strain of muscle.....	198		18	6	10			2	180
Submersion.....	5		4	4					1
Sunburn.....	16								16
Sunstroke (heat stroke).....	6		4	2	1		1		2
Synovitis, traumatic.....	24		8	1	6		1		16
Torsion of spermatic cord, traumatic.....	2		1		1				1
Wound of:									
Abdominal wall, incised.....	44		2		2				42
Abdominal wall, lacerated.....	22		4	2	2				18
Abdominal wall, stab.....	3		2	2					1
Alveoli, incised.....	1								1
Alveoli, lacerated.....	1		1	1					
Arm, incised.....	105		8	3	4			1	97
Arm, lacerated.....	207		14	6	7			1	193
Arm, punctured.....	14	1	1	2					12
Arm, gunshot.....	2		2	2					
Arm, stab.....	4		1	1					3
Artery, lacerated.....	1								1
Back, incised.....	17								17
Back, lacerated.....	20		12	1	1				8
Back, punctured.....	1								1
Back, stab.....	3		2		2				1
Bladder, lacerated.....	1		1						1
Bone, lacerated.....	1		1		1				
Bone, stab.....	1		1	1					3
Brain, lacerated.....	3								
Brain, gunshot.....	1		1				1		
Breast, lacerated.....	1		1	1					
Buttock, incised.....	4								4
Buttock, lacerated.....	1		1	1					
Buttock, punctured.....	1		1		1				1
Buttock gunshot.....	2		1	1					1
Chest wall, incised.....	18								18
Chest wall, lacerated.....	10		6	2	3	1			4
Chest wall, gunshot.....	1		1	1					
Chest wall, stab.....	2		2	2					
Esophagus, lacerated.....	1		1					1	
External ear, incised.....	6								6
External ear, lacerated.....	10		1		1				9
Eye, incised.....	15		7	5	2				8
Eye, lacerated.....	32		9	4	4			1	23
Eyelid, incised.....	23		7	5	1	1			16
Eyelid, lacerated.....	23		3	2	1				20
Eyelid, punctured.....	2								2
Face, incised.....	106		5	3	2				101
Face, lacerated.....	207		39	21	15	1		2	168
Face, punctured.....	7		5	1	4				2
Finger, incised.....	710	1	12	7	5	1			697
Finger, lacerated.....	1,529	2	100	32	66	1		3	1,427
Finger, punctured.....	60		4		4				56
Foot, incised.....	149		5	1	4				144
Foot, lacerated.....	216	2	41	26	14	2		1	173
Foot, punctured.....	199		38	27	9			2	161
Foot, gunshot.....	3		3	1		1		1	
Forearm, incised.....	73		1	1					72
Forearm, lacerated.....	63		8	4	3			1	55
Forearm, punctured.....	1		1	1					
Gum, lacerated.....	3		3	2	1				
Gum, gunshot.....	1		1					1	
Hand, incised.....	531		10	4	6				521
Hand, lacerated.....	581	1	47	28	16	1		3	533

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1918—Continued.*

Diseases and injuries.	Total treated in hospital and dispensary.	Re-mair-ing in hos-pital from pre-vi-ous year.	Ad-mitted dur-ing the year.	Re-cov-ered.	Im-proved.	Not im-proved.	Died.	Re-mair-ing in hos-pital at close of year.	Treated at dis-pens-ary.
<i>Injuries (wounds, etc.)—Contd.</i>									
Wound of—Continued.									
Hand, punctured.	250	1	14	7	7	1			235
Hand, gunshot.	4	1	2	1	1			1	1
Hand, stab.	3		1		1				2
Heart, lacerated.	1								1
Joint, incised.	17	1			1				16
Joint, lacerated.	56	1	6	3	4				49
Joint, punctured.	2		2	1	1				
Joint, gunshot.	3		3	1	1	1			
Kidney, incised.	9								9
Larynx, lacerated.	5								5
Leg, incised.	228		8	7	1				220
Leg, lacerated.	283	1	43	15	27			2	239
Leg, punctured.	44		3	1	2				41
Leg, gunshot.	11		10	4	5			1	1
Lips, incised.	12								12
Lips, lacerated.	28		5	3	2				23
Lung, lacerated.	1		1	1					
Muscle, incised.	1		1	1					
Muscle, lacerated.	11								11
Neck, incised.	22	1	2	2					19
Neck, lacerated.	10		4	2	2				6
Neck, gunshot.	2								2
Nose, incised.	16								16
Nose, lacerated.	8		1	1					7
Palate, lacerated.	4								4
Palate, stab.	2								2
Pancreas, incised.	6								6
Pancreas, lacerated.	50								50
Pancreas, punctured.	1								1
Penis, lacerated.	2		2	1	1				
Perineum, lacerated.	1		1		1				
Pharynx, lacerated.	2								2
Rectum, incised.	1								1
Scalp, incised.	182		3	1	2				179
Scalp, lacerated.	352	1	77	42	32	2		2	274
Scalp, gunshot.	1		1		1				
Salivary gland, lacerated.	1		1	1					
Scrotum, incised.	1								1
Scrotum, lacerated.	2		2	1	1				
Scrotum, punctured.	1	1		1					
Shoulder, incised.	7		1		1				6
Shoulder, lacerated.	13		1		1				12
Shoulder, punctured.	2								2
Shoulder, gunshot.	1		1					1	
Shoulder, stab.	3		3	3					
Spinal cord, punctured.	1		1		1				
Teeth.	1								1
Tendon, lacerated.	6								6
Testicle, lacerated.	4								4
Thigh, incised.	3		3	2	1				
Thigh, lacerated.	70		8	6	2				62
Thigh, punctured.	1		1	1					
Thigh, gunshot.	5		4	2	1			1	1
Thigh, stab.	1		1		1				
Toe, incised.	14		1		1				13
Toe, lacerated.	199	1	30	19	10	1			168
Toe, punctured.	3								3
Tongue, lacerated.	5		1		1				4
Tonsil, lacerated.	1								1
Urethra, lacerated.	1		1	1					
Urethra, punctured.	1		1	1					
Vein, incised.	2								2
Otherwise unclassified, in-cised.	229	1			1				228
Otherwise unclassified, lac-erated.	18		18	11	5			2	
Otherwise unclassified, stab.	1		1	1					
No diagnosis.	49		48	4	5	38		1	



TABLE 5.—*Surgical operations performed during the fiscal year 1918.*

Operation for—	Character and name of operation.	Num- ber of cases.	Suc- cess- ful.	Unsuc- cess- ful.	Died.
Abscess:					
Auditory canal.....	Incision and drainage.....	2	2	.....	.....
Axilla.....	do.....	4	4	.....	.....
Do.....	Incision.....	1	1	.....	.....
Abdominal wall.....	do.....	1	1	.....	.....
Appendiceal.....	Incision and drainage.....	2	2	.....	.....
Abdomen.....	do.....	1	.....	.....	1
Abdomen, traumatic.....	Incision and curettage.....	1	1	.....	.....
Alveolar.....	Incision and drainage.....	1	1	.....	.....
Do.....	Extraction of tooth.....	1	1	.....	.....
Do.....	Incision.....	1	1	.....	.....
Arm.....	Incision and drainage.....	11	11	.....	.....
Do.....	Incision and curettage.....	4	4	.....	.....
Back.....	Incision and drainage.....	3	3	.....	.....
Buttock.....	do.....	5	5	.....	.....
Do.....	Incision and curettage.....	1	1	.....	.....
Chest wall.....	Thoracotomy.....	1	1	.....	.....
Eyelid.....	Incision.....	2	2	.....	.....
Elbow.....	Multiple incisions.....	1	1	.....	.....
Do.....	Incision and drainage.....	5	5	.....	.....
Face.....	do.....	7	7	.....	.....
Femoral gland.....	Incision.....	1	1	.....	.....
Foot.....	Incision and drainage.....	6	6	.....	.....
Do.....	Incision.....	5	5	.....	.....
Finger.....	Incision and drainage.....	9	9	.....	.....
Do.....	Incision.....	1	1	.....	.....
Forearm.....	Incision and drainage.....	1	1	.....	.....
Hand.....	do.....	9	9	.....	.....
Do.....	Incision.....	3	3	.....	.....
Head.....	Incision and drainage.....	3	3	.....	.....
Hip.....	do.....	1	1	.....	.....
Inguinal.....	do.....	6	6	.....	.....
Do.....	Incision.....	1	1	.....	.....
Do.....	Incision and curettage.....	1	1	.....	.....
Ischiorectal.....	Incision and drainage.....	3	3	.....	.....
Jaw.....	do.....	2	2	.....	.....
Kidney.....	do.....	3	3	.....	.....
Knee.....	do.....	4	4	.....	.....
Do.....	Incision.....	1	1	.....	.....
Leg.....	Incision and drainage.....	6	6	.....	.....
Do.....	Incision.....	1	1	.....	.....
Lip.....	Incision and drainage.....	1	1	.....	.....
Do.....	Incision.....	2	2	.....	.....
Lung.....	Thoracotomy and drainage.....	1	1	.....	.....
Do.....	Resection of rib.....	1	1	.....	.....
Lymph nodes.....	Incision and curettage.....	1	1	.....	.....
Liver.....	Exploratory laparotomy and drainage.....	6	6	.....	.....
Do.....	Excision.....	1	1	.....	.....
Neck.....	Incision and drainage.....	5	5	.....	.....
Do.....	Incision.....	2	2	.....	.....
Ovary and Fallopian tube.....	Laparotomy and bilateral salpingo- oophorectomy.....	1	1	.....	.....
Palmar.....	Incision and drainage.....	10	10	.....	.....
Postcervical gland.....	do.....	1	1	.....	.....
Post sternal.....	Thoracic and cervical incisions.....	1	.....	.....	1
Perineal.....	Incision and drainage.....	3	3	.....	.....
Do.....	Incision.....	1	1	.....	.....
Perinephritic.....	Incision and drainage.....	4	4	.....	.....
Pelvic.....	Drainage.....	1	.....	.....	1
Penis.....	Incision and drainage.....	2	2	.....	.....
Peritoneum.....	Incision and curettage.....	1	1	.....	.....
Periurethral.....	Drainage.....	3	3	.....	.....
Do.....	Incision.....	1	1	.....	.....
Pharyngeal.....	do.....	2	2	.....	.....
Perianal.....	Incision and curettage.....	3	3	.....	.....
Do.....	Incision and drainage.....	6	6	.....	.....
Periosteum.....	Incision.....	1	1	.....	.....
Rectum.....	Incision and curettage.....	1	1	.....	.....
Do.....	Incision.....	8	8	.....	.....
Do.....	Excision.....	1	1	.....	.....
Do.....	Incision and drainage.....	8	8	.....	.....
Subphrenic.....	do.....	1	1	.....	.....
Scrotum.....	do.....	4	4	.....	.....
Do.....	Aspiration.....	1	1	.....	.....
Submammary.....	Incision and drainage.....	1	1	.....	.....
Spermatic cord.....	do.....	1	1	.....	.....
Shoulder.....	do.....	1	1	.....	.....
Salivary glands.....	do.....	1	1	.....	.....
Thigh.....	do.....	2	2	.....	.....
Tonsillar.....	do.....	16	16	.....	.....
Do.....	Canterization.....	1	1	.....	.....

TABLE 5.—*Surgical operations performed during the fiscal year 1918—Continued.*

Operation for—	Character and name of operation.	Number of cases.	Successful.	Unsuccessful.	Died.
Abscess—Continued.					
Thecal.....	Incision and drainage.....	1	1		
Thumb.....	Incision.....	3	3		
Toe.....	do.....	4	4		
Teeth.....	Extraction of teeth.....	1	1		
Tubercular.....	Enucleation of gland of neck.....	1	1		
Multiple.....	Incision and drainage.....	1	1		
Adenoids and polyp.....	Snare.....	1	1		
Adenoids.....	Adenectomy.....	7	7		
Angioma of lip.....	Cauterization.....	1	1		
Aneurysm:					
Femoral artery.....	Ligation and evacuation of sac.....	1			1
Popliteal artery.....	Removal of sac, ligation of vessels.....	1	1		
Adhesions:					
About cecum.....	Release.....	1	1		
About stomach.....	do.....	1	1		
Peritoneum.....	Laparotomy.....	3	3		
Intestinal.....	Separated; appendix stump obliterated.....	1	1		
About shoulder.....	Release.....	1	1		
Ascites.....	Paracentesis.....	3	3		
Adenoma, right groin.....	Excision of glands.....	1	1		
Adenitis:					
Inguinal.....	Incision and drainage.....	19	19		
Do.....	Adenectomy.....	23	23		
Do.....	Enucleation of glands.....	1	1		
Cervical.....	Dorsal incision.....	1	1		
Amygdalitis:					
Acute.....	Tonsillectomy.....	56	56		
Chronic.....	do.....	189	189		
Do.....	Dissection.....	5	5		
Do.....	Enucleation.....	3	3		
Chronic and pneumonia.....	Tonsillectomy.....	1			
Ankylosis:					
Ankle.....	Incision and drainage.....	1		1	
Finger.....	Finger broken and reset.....	1	1		
Jaw.....	Resection.....	1	1		
Knee.....	Adhesions broken.....	1	1		
Anemia, pernicious.....	Fauntleroy blood transfusion.....	1			1
Appendicitis.....	Appendectomy.....	188	181		7
Do.....	McBurney.....	3	3		
Do.....	Drainage.....	6	6		
Do.....	Laparotomy and drainage.....	2	1		1
Avulsion of:					
Arm (partial).....	Repair.....	1	1		
Eye.....	Removal of eye.....	1	1		
Finger.....	Amputation.....	3	3		
Finger (partial).....	Sutured and dressed.....	2	2		
Foot (partial).....	Repair.....	1	1		
Hand.....	Revision of stump.....	1	1		
Leg.....	Amputation, tibia and fibula.....	1	1		
Arm.....	Drainage of joint and amputation at shoulder.....	1	1		
Arthritis of:					
Ankle.....	Drainage, ankle joint.....	1	1		
Sciatic nerve.....	Injection saline and cocaine.....	3	3		
Knee joint.....	Incision and drainage.....	1	1		
Chronic.....	Neodiarsenol.....	2	2		
Burns:					
Hand.....	Skin graft.....	1	1		
Multiple.....	Extensive skin graft.....	1	1		
Blood donor.....	Transfusion (donor rec.).....	1			1
Bursitis.....	Bursa opened and drained.....	1	1		
Do.....	Bursa removed.....	2	2		
Bursitis of knee.....	Resection of bursa.....	3	3		
Do.....	Aspiration.....	1	1		
Biliary calculi.....	Cholelithotomy.....	1	1		
Carbuncle:					
Abdomen.....	Incision and curettage.....	1	1		
Arm.....	Incision and drainage.....	1	1		
Back.....	Excision and curettage.....	3	3		
Do.....	Incision.....	2	2		
Leg.....	Incision and drainage.....	2	2		
Neck.....	do.....	7	7		
Do.....	Curetted and dressed.....	1	1		
Do.....	Excision.....	3	3		
Contusion of:					
Back (hematoma).....	Incision and evacuation.....	1	1		
Face.....	Incision and drainage.....	1	1		
Finger.....	do.....	2	2		
Do.....	Repair operation.....	1	1		
Foot.....	Incision and drainage.....	2	2		

TABLE 5.—Surgical operations performed during the fiscal year 1918—Continued.

Operation for—	Character and name of operation.	Number of cases.	Successful.	Unsuccessful.	Died.
Contusion of—Continued.					
Hand.....	Amputation second finger.....	1	1	.....	.....
Leg.....	Fixation.....	1	1	.....	.....
Leg (hematoma).....	Incision and evacuation.....	1	1	.....	.....
Thigh.....	Incision and drainage.....	1	1	.....	.....
Cholecystitis, chronic.....	Cholecystectomy.....	2	2	.....	.....
Cholecystitis, phlegmonous.....	do.....	1	1	.....	.....
Do.....	do.....	1	.....	.....	1
Cholecystitis, acute.....	do.....	3	3	.....	.....
Chalazion.....	Incision.....	1	1	.....	.....
Do.....	Excision.....	2	2	.....	.....
Cystitis, chronic.....	Suprapubic cystotomy.....	1	1	.....	.....
Cystoma of forehead.....	Excision.....	1	1	.....	.....
Calculus in bladder.....	Suprapubic lithotomy.....	1	1	.....	.....
Do.....	Removal.....	2	1	.....	1
Calculus in urethra.....	Suprapubic cystotomy.....	2	.....	1	1
Do.....	Urethrotomy.....	1	.....	.....	1
Contracture of:					
Little finger.....	Amputation.....	2	2	.....	.....
Do.....	Stretching of tendons.....	1	1	.....	.....
Callositas of foot.....	Excision and suture.....	7	7	.....	.....
Cataract of eye.....	Dissection and removal.....	3	3	.....	.....
Do.....	Smith extraction.....	1	1	.....	.....
Do.....	Iridectomy.....	1	1	.....	.....
Cataract of eye, traumatic.....	Removal of lens.....	2	2	.....	.....
Carcinoma of:					
Abdomen.....	Exploratory laparotomy.....	1	.....	.....	1
Bladder.....	Suprapubic cystotomy.....	1	.....	1	.....
Do.....	Exploratory incision.....	1	.....	1	.....
Larynx.....	Tracheotomy.....	1	.....	1	.....
Do.....	Excision and drainage.....	1	.....	.....	1
Do.....	Laryngectomy.....	1	.....	1	.....
Lip.....	Resection.....	5	5	.....	.....
Liver.....	Right rectus incision.....	1	.....	.....	1
Rectum.....	Kraske modified.....	1	.....	1	.....
Stomach.....	Exploratory laparotomy.....	1	.....	1	.....
Do.....	Gastro-jejunostomy.....	2	1	.....	1
Do.....	Gastro-enterostomy.....	1	1	.....	.....
Do.....	Post gastro-enterostomy.....	2	1	.....	1
Stomach, with glandular metastasis.....	Gastro-enterostomy.....	1	1	.....	.....
Submaxillary gland.....	Excision.....	1	1	.....	.....
Tongue.....	Excision one-half of tongue.....	2	2	.....	.....
Do.....	Excision cervical glands.....	2	2	.....	.....
Testicle.....	Radical orchidectomy.....	1	1	.....	.....
Cellulitis:					
Arm.....	Incision and drainage.....	5	5	.....	.....
Finger.....	Incision.....	3	3	.....	.....
Do.....	Incision and drainage.....	1	1	.....	.....
Do.....	Amputation.....	2	2	.....	.....
Foot.....	Incision and drainage.....	3	3	.....	.....
Hand.....	do.....	9	8	.....	1
Knee.....	do.....	3	3	.....	.....
Leg.....	do.....	7	7	.....	.....
Do.....	Multiple incisions.....	3	3	.....	.....
Neck.....	Incision and drainage.....	3	3	.....	.....
Cicatrical contraction.....	Excision and plaster repair.....	6	6	.....	.....
Clavus of foot.....	Excision and suture.....	5	5	.....	.....
Do.....	Excision.....	2	2	.....	.....
Crush of:					
Great toe.....	Plastic operation.....	2	2	.....	.....
Finger.....	Amputation.....	6	6	.....	.....
Do.....	Sutured.....	5	5	.....	.....
Fingers and thumb.....	Amputation.....	2	2	.....	.....
Arm.....	Removal of fragments and suture of muscles.....	1	1	.....	.....
Hand.....	Ligation and suture.....	4	4	.....	.....
Leg.....	Amputation.....	1	1	.....	.....
Foot.....	do.....	1	1	.....	.....
Thumb.....	do.....	1	1	.....	.....
Chancroid of:					
Penis.....	Cautery.....	2	2	.....	.....
Do.....	Circumcision and thermocautery.....	1	1	.....	.....
Do.....	Amputation.....	1	1	.....	.....
Do.....	Circumcision.....	3	3	.....	.....
Do.....	Incision.....	2	2	.....	.....
Do.....	Dorsal incision.....	4	4	.....	.....
Caries of teeth.....	Curettage.....	1	1	.....	.....
Do.....	Extraction.....	15	15	.....	.....

TABLE 5.—Surgical operations performed during the fiscal year 1918—Continued.

Operation for—	Character and name of operation.	Number of cases.	Successful.	Unsuccessful.	Died.
Cyst of:					
Back, retention.....	Excision.....	1	1		
Buttock.....	do.....	1	1		
Cheek.....	do.....	1	1		
Ear.....	do.....	2	2		
Face.....	do.....	5	5		
Do.....	Incision and drainage.....	3	3		
Head.....	Excision.....	1	1		
Leg, sebaceous.....	do.....	1	1		
Liver, echinococcus.....	Hepatotomy and removal.....	1	1		
Penis, retention.....	Incision.....	2	2		
Retention.....	Excision.....	5	5		
Sebaceous.....	Incision and curettage.....	1		1	
Do.....	Excision.....	21	21		
Urethra.....	Removal.....	1	1		
Decubitus ulcer.....	Curettage and cautery.....	1			1
Dislocation of:					
Bones of foot.....	Reduction.....	1	1		
Elbow.....	do.....	1	1		
Humerus.....	Internal operation fixation of head of humerus.....	1	1		
Do.....	Extension.....	1	1		
Intra-articular cartilage (knee).....	Excision of floating cartilage.....	1	1		
Knee.....	Reduction.....	1	1		
Metacarpus.....	do.....	1	1		
Shoulder.....	do.....	4	4		
Do.....	Reduction (Kocher).....	1	1		
Ninth vertebra.....	Laminectomy and suture of dura.....	1			1
Deviation of nasal septum.....	Submucous resection.....	34	34		
Do.....	Operation for deflected septum.....	1	1		
Exostosis of os calcis.....	Osteotomy.....	2	2		
Empyema.....	Incision and drainage.....	2	2		
Do.....	Resection of rib.....	3	1		2
Do.....	Thoracentesis.....	1			1
Do.....	Decortication of lung.....	1			1
Enlargement of prostate.....	Suprapubic prostatectomy.....	3	2		1
Do.....	Partial prostatectomy.....	1			1
Elongated prepuce.....	Circumcision and cautery.....	3	3		
Do.....	Dorsal incision.....	1	1		
Elongated uvula.....	Amputation.....	1	1		
Epididymitis.....	Drainage.....	2	2		
Do.....	Epididymotomy.....	1	1		
Epithelioma of:					
Ear.....	Excision.....	1	1		
Face.....	Rhinoplasty, 3 stages.....	4	4		
Leg.....	Amputation.....	1	1		
Lip.....	Excision of tumor and gland.....	2	2		
Do.....	Excision.....	7	7		
Nose.....	do.....	2	2		
Fissure of anus.....	do.....	1	1		
Do.....	Curettage.....	5	5		
Do.....	Dilatation.....	1		1	
Flail joint, humerus.....	Intermedullary bone graft.....	1	1		
Fistula of urethra.....	Urethrotomy.....	4	4		
Fistula in ano.....	Excision.....	11	11		
Do.....	Fistulous tract opened.....	3	3		
Do.....	Incision and drainage.....	13	12	1	
Do.....	Incision and curettage.....	14	13	1	
Do.....	Plastic operation.....	5	4	1	
Do.....	Opened into bowel, curetted.....	1	1		
Fistula, fecal.....	Closure.....	1		1	
Do.....	Resection with end-to-end anastomosis.....	1			1
Fistula of bladder.....	Excision and suture.....	1		1	
Do.....	Incision and drainage.....	1			1
Faulty union of:					
Tibia and fibula.....	Open reduction.....	1	1		
Radius.....	Removal of sequestrum.....	3	3		
Inferior maxillary.....	Removal of dead bone.....	1	1		
Nasal bones.....	Removal of excess calus.....				3
Tibia and fibula.....	Reduction, Lane plate and cast.....	1	1		
Fracture of:					
Ankle.....	Reduction.....	1	1		
Do.....	Osteotomy, both bones.....	1	1		
Do.....	Amputation.....	1	1		
Ankle, compound.....	Reduction and splint.....	7	7		
Arm, compound.....	Amputation.....	1	1		
Do.....	Skin graft on stump.....	1	1		

TABLE 5.—*Surgical operations performed during the fiscal year 1918—Continued.*

Operation for—	Character and name of operation.	Num-ber of cases.	Suc-cess-ful.	Unsuc-cess-ful.	Died.
<b>Fracture of—Continued.</b>					
Arm.....	Cast.....	1	1		
Bones of leg—					
Compound.....	Plated tibia.....	1	1		
Do.....	Reduction, cast.....	2	2		
Do.....	Tenotomy.....	1	1		
Simple.....	Plated tibia, cast.....	1	1		
Do.....	Reduction and cast.....	10	10		
Clavicle.....	Wired.....	3	3		
Do.....	Reduction and cast.....	7	7		
Clavicle, compound.....	Fragments wired, cast.....	1	1		
Colles.....	Reduction.....	2	2		
Forearm.....	Reduction and cast.....	10	9	1	
Forearm, compound.....	Reduction and suture.....	1	1		
Finger—					
Compound.....	Amputation.....	3	3		
Do.....	Incision, extension.....	1	1		
Simple.....	Splint.....	2	2		
Face.....	Examination and extraction, 1 tooth.....	1	1		
Do.....	Reduction.....	2	2		
Do.....	Special splint.....	1	1		
Face, compound.....	Wired, cast.....	2	2		
Femur, simple.....	Exploratory incision.....	1		1	
Do.....	Reduction.....	8	8		
Femur.....	Amputation.....	1			1
Do.....	Reduction and splint.....	3	3		
Femur, simple and compound.....	Reduction (both legs).....	1	1		
Frontal bone, compound.....	Exploratory vault of skull.....	1			1
Foot.....	Reset and cast applied.....	1	1		
Compound.....	Resection.....	1	1		
Do.....	Reduction and cast.....	12	12		
Do.....	Removal of necrotic bone.....	1	1		
Fibula, compound.....	Reduction and suture.....	1	1		
Humerus.....	Nailed in position.....	1	1		
Do.....	Wired.....	3	3		
Do.....	"Lane" plate applied.....	1	1		
Do.....	Reduction.....	1	1		
do.....	do.....	1	1		
Hip.....	do.....	1	1		
Hands.....	Eight fingers amputated.....	1	1		
Hand.....	Splint.....	4	4		
Hand compound.....	Amputation little finger.....	1	1		
Do.....	Suture and drainage.....	1	1		
Do.....	Excision of dead bone.....	1	1		
Jaw.....	Resection portion inferior maxillary.....	1	1		
Do.....	Reduction.....	1	1		
Leg.....	do.....	1	1		
Leg, compound.....	Reduction, wiring and fixation.....	1	1		
Metacarpal—					
Simple.....	Reduction and splint.....	2	2		
Compound.....	Incision and drainage.....	1	1		
Multiple, both feet and legs.....	Reduction and cast.....	1	1		
Maxilla, inferior.....	Bone plated.....	2	2		
Maxilla.....	Wired.....	1	1		
Nasal septum.....	Reduction, splint.....	2	2		
Os calcis.....	Reduction attempted.....	1		1	
Do.....	Bone fragment removed.....	1	1		
Patella.....	Suture capsule.....	1	1		
Do.....	Wired.....	1	1		
Patella (old).....	Wire removed.....	1	1		
Pelvis.....	Strapped.....	1	1		
Radius.....	Reduction and cast.....	2	2		
Do.....	Plated.....	1	1		
Ribs.....	Fixation.....	6	6		
Scapula.....	Reduction and bandage.....	2	2		
Skull.....	Decompression.....	2	1		1
Do.....	Subtemporal decompression.....	2	1		1
Do.....	Operation for relief of depression.....	1			1
Do.....	Expectant.....	1	1		
Tibia and fibula.....	Reduction and cast.....	7	7		
Compound, common.....	Drainage and splint.....	2	2		
Simple.....	Plate removed, bone graft.....	1	1		
Compound.....	Amputation, upper third.....	1	1		
Toe, compound.....	Amputation.....	1	1		
Thumb.....	Reduction and splint.....	2	2		
Thumb, compound.....	Excision splintered bone, suture.....	1	1		
Tibia.....	Revision and plating.....	1	1		
Do.....	Cast.....	2	2		
Do.....	Plated.....	1	1		
Tibia, compound.....	Fragments approximated.....	1	1		
Ulna and radius.....	Reduction.....	3	3		
Ulna.....	Reduction and splint.....	2	2		
Vertebrae.....	Reduction and cast.....	1			1

TABLE 5.—Surgical operations performed during the fiscal year 1918—Continued.

Operation for—	Character and name of operation.	Num-ber of cases.	Suc-cess-ful.	Unsuc-cess-ful.	Died.
Fracture of—continued.					
Wrist.....	Reduction and splint.....	1	1		
Do.....	Reduction and fixation.....	2	2		
Do.....	Reduction and cast.....	3	3		
Fracture deformity of nose.....	Replacement.....	1	1		
Frostbite of:					
Toe.....	Amputation.....	3	3		
Do.....	Removal of nail.....	1	1		
Furunculosis.....	Incision and drainage.....	29	29		
Foreign body in:					
Pleural cavity.....	Removal and resection of ribs.....	1	1		
Chest wall.....	Removal.....	1	1		
Cornea.....	Curettage.....	1	1		
Esophagus.....	Removal with probang.....	1	1		
Finger.....	Incision and removal.....	3	3		
Forearm.....	do.....	3	2	1	
Foot.....	do.....	2	2		
Hand.....	do.....	7	7		
Knee joint.....	do.....	2	2		
Scalp.....	do.....	1	1		
Eye.....	Removed and dressed.....	13	13		
Hip.....	Incision and removal.....	1	1		
Fibroma of:					
Finger.....	Enucleation.....	1	1		
Parotid.....	Excision.....	1	1		
Forearm.....	do.....	2	2		
Gonorrhea.....	Vas punctum injection.....	3	3		
Gangrene of:					
Finger.....	Amputation.....	2	2		
Foot, diabetic.....	do.....	1	1		
Testicle.....	Castration.....	1	1		
Do.....	Incision and drainage.....	1	1		
Toe.....	Amputation.....	1	1		
Do.....	Disarticulation.....	1	1		
Ileum.....	Exploratory laparotomy.....	1	1		
Ileum, perforated.....	Ileocolostomy.....	2	2		
Ganglion of tendon.....	Excision.....	2	2		
Growth in testicle.....	Removal.....	1	1		
Gonococcus infection of calcis.....	Excision of spurs.....	3	3		
Gonococcus infection epididymis.....	Epididymotomy.....	1	1		
Do.....	Incision and drainage.....	1	1		
Gonococcus infection of lymph nodes, inguinal.....	Excision.....	9	9		
Do.....	Incision and drainage.....	8	8		
Do.....	Incision and dissection.....	1	1		
Do.....	Enucleation.....	2	2		
Gonococcus infection of lymph nodes, groin.....	Dissection.....	2	2		
Glaucoma.....	Removal of eye.....	1	1		
Do.....	Sclera trephined.....	1	1		
Do.....	Sclerotomy (Elliot).....	1	1		
Goiter.....	Resection.....	1	1		
Exophthalmic.....	Suprathyroid ligation.....	1	1		
Do.....	Balfour thyroidectomy.....	1	1		
Cystic.....	Removal of isthmus, resection left lobe.....	1	1		
Hallux, varus.....	Resection of joint and plastic repair.....	2	2		
Hallux, valgus.....	Mayo arthroplasty.....	7	7		
Hammer toe.....	Excision and tenotomy.....	1	1		
Do.....	Amputation.....	3	3		
Do.....	Partial excision proximate phalanx.....	1	1		
Hypernephroma.....	Nephrectomy.....	1			1
Hemorrhoids:					
External—					
Do.....	Ligation and excision.....	6	6		
Do.....	Ligature method.....	2	2		
Do.....	Incision and ligation.....	3	3		
Do.....	Incision and drainage.....	2	2		
Do.....	Clamp and cautery.....	4	4		
Do.....	Excision.....	16	16		
Do.....	Hemorrhoidectomy.....	10	10		
Do.....	Suture (Pilcher).....	1	1		
Do.....	Resection (Whitehead).....	3	3		
Do.....	Mayo.....	2	2		
Do.....	Excision and suture.....	5	5		
Internal.....	Clamp and cautery.....	14	14		
Do.....	Plastic resection.....	1	1		
Do.....	Hemorrhoidectomy.....	4	4		
Do.....	Ligation.....	2	2		
Do.....	Ligation and excision.....	15	15		
Do.....	Mayo.....	2	2		
Do.....	Whitehead.....	1	1		
Do.....	Excision and suture.....	16	16		

TABLE 5.—Surgical operations performed during the fiscal year 1918—Continued.

Operation for—	Character and name of operation.	Number of cases.	Successful.	Unsuccessful.	Died.
<b>Hemorrhoids—Continued.</b>					
Mixed.....	Hemorrhoidectomy.....	3	3	.....	.....
Do.....	Ligation.....	6	6	.....	.....
Do.....	Resection.....	1	1	.....	.....
Do.....	Excision, partial.....	2	2	.....	.....
Do.....	Clamp and cautery.....	5	5	.....	.....
Do.....	Incision, transfixation, and ligation.....	2	2	.....	.....
Do.....	Excision and suture.....	12	12	.....	.....
<b>Hypertrophy of:</b>					
Tonsil.....	Tonsillectomy.....	12	12	.....	.....
Testicle.....	Castration, left.....	1	1	.....	.....
Turbinates.....	Tonsillectomy.....	1	.....	1	.....
Do.....	Excision.....	8	8	.....	.....
Do.....	Turbinectomy.....	1	1	.....	.....
Prostate.....	Suprapubic prostatectomy.....	1	1	.....	.....
Turbinates.....	Posterior tips removed.....	1	1	.....	.....
Do.....	Middle turbinates removed.....	1	1	.....	.....
Do.....	Turbinectomy.....	3	3	.....	.....
Lymph glands.....	Excision.....	1	1	.....	.....
<b>Hydrocele of tunica vaginalis.</b>	Aspiration.....	8	8	.....	.....
Do.....	Bottle operation.....	16	16	.....	.....
Do.....	Excision.....	9	9	.....	.....
Do.....	Incision and suture.....	2	2	.....	.....
Do.....	Retroversion of sac.....	1	1	.....	.....
<b>Hydrocele, bubonocoele</b>	Herniotomy, bottle operation.....	1	1	.....	.....
<b>Hydrocele of scrotum</b>	Aspiration.....	1	1	.....	.....
Do.....	Resection of sac.....	1	1	.....	.....
<b>Hydrocele of spermatic cord</b>	Excision of sac.....	4	4	.....	.....
<b>Hematoma of:</b>					
Back.....	Incision and drainage.....	1	1	.....	.....
Buttock.....	do.....	3	3	.....	.....
Scrotum.....	do.....	1	1	.....	.....
<b>Hæmatocele</b>	Excision of tumor.....	1	1	.....	.....
<b>Hemiplegia</b>	Neodiarsenol.....	1	1	.....	.....
<b>Hernia:</b>					
Inguinal.....	Bates-Andrews.....	12	12	.....	.....
Do.....	Halsted.....	2	2	.....	.....
Do.....	Ferguson.....	27	27	.....	.....
Do.....	Modified Bassini and castration.....	1	1	.....	.....
Do.....	Bassini.....	100	99	.....	1
Do.....	Andrews.....	11	11	.....	.....
Do.....	Herniotomy.....	129	129	.....	.....
Do.....	Bates hernioplasty.....	32	32	.....	.....
Do.....	Radical cure.....	8	8	.....	.....
Do.....	Bassini modified.....	68	68	.....	.....
Do.....	Bates-Bassini.....	12	12	.....	.....
Inguinal, double.....	Ferguson and Bassini modified.....	1	1	.....	.....
<b>Strangulated.</b>	Reduction.....	1	1	.....	.....
Do.....	Herniotomy.....	12	11	.....	1
Do.....	Radical cure.....	2	2	.....	.....
<b>Omental (postoperative)</b>	Repair and release of adhesions.....	1	1	.....	.....
<b>Ventral.</b>	Herniotomy.....	6	6	.....	.....
Do.....	Hernioplasty.....	2	2	.....	.....
Do.....	Mayo.....	1	1	.....	.....
Do.....	Radical.....	1	1	.....	.....
<b>Scrotal.</b>	Bassini.....	1	.....	.....	1
Do.....	Herniotomy.....	1	1	.....	.....
Do.....	Bassini modified.....	2	2	.....	.....
<b>Femoral.</b>	Herniorrhaphy.....	1	1	.....	.....
Do.....	Bates hernioplasty.....	1	1	.....	.....
Do.....	Herniotomy.....	2	2	.....	.....
Do.....	Moscovitz.....	1	1	.....	.....
<b>Umbilical.</b>	Hernioplasty.....	1	1	.....	.....
Do.....	Mayo.....	3	3	.....	.....
Epigastric.....	do.....	1	1	.....	.....
<b>Ingrowing nail.</b>	Plastic.....	1	1	.....	.....
Do.....	Excision.....	27	27	.....	.....
<b>Impacted feces.</b>	Manual removal.....	1	1	.....	.....
<b>Intestinal obstruction.</b>	Laparotomy and release of adhesions.....	3	3	.....	.....
Do.....	Release of adhesions.....	1	.....	.....	1
Do.....	Ileostomy.....	1	1	.....	.....
<b>Iritis.</b>	Enucleation.....	1	1	.....	.....
<b>Intracranial injury.</b>	Trephinement.....	1	.....	.....	1
<b>Jaundice, acute infection.</b>	Drainage of gall bladder.....	1	1	.....	.....
<b>Lipoma of:</b>					
Arm.....	Excision.....	4	4	.....	.....
Abdomen.....	Herniotomy and removal of tumor.....	1	1	.....	.....
Back.....	Excision.....	8	8	.....	.....
Head.....	Incision and examination.....	1	1	.....	.....
Do.....	Removal.....	2	2	.....	.....

TABLE 5.—*Surgical operations performed during the fiscal year 1918—Continued.*

Operation for--	Character and name of operation.	Number of cases.	Successful.	Unsuccessful.	Died.
Lipoma of—Continued.					
Neck.....	Enucleation.....	1	1		
Shoulder.....	Removal.....	2	2		
Lymphadenitis:					
Acute.....	Excision of glands.....	21	21		
Do.....	Buboes incised and drained.....	52	52		
Do.....	Curettage.....	3	3		
Do.....	Incision.....	33	33		
Chronic.....	Incised and drained.....	4	4		
Lymphadenitis.....	Enucleation of glands.....	35	35		
Do.....	Excision and drainage.....	20	20		
Do.....	Dissection.....	7	7		
Do.....	Adenectomy.....	3	3		
Lymphadenitis, inguinal.....	Incision and drainage.....	21	21		
Lymphadenitis, balanoposthitis.....	Circumcision and inguinal dissection.....	5	5		
Lymphadenitis, phimosis.....	Circumcision and dissection.....	1	1		
Lymphadenitis, chancreoid.....	Excision and cauterization.....	3	3		
Do.....	Incision and drainage.....	1	1		
Do.....	Adenectomy.....	3	3		
Do.....	Inguinal dissection.....	1	1		
Do.....	Excision of glands.....	5	5		
Lymphadenitis, femoral.....	do.....	2	2		
Do.....	Incision and drainage.....	1	1		
Lymphadenitis, cervical.....	Excision of glands.....	1	1		
Lymphadenitis, groin.....	Incision and drainage.....	4	4		
Lymphangitis:					
Arm.....	do.....	3	2		1
Leg.....	do.....	3	3		
Lymphangiectasis.....	Exkondoleon.....	1	1		
Malformation of:					
Urethra.....	Transplantation.....	2		2	
Foot.....	Amputation.....	1	1		
Finger.....	do.....	1	1		
Testicle.....	Bevan.....	1	1		
Mastoiditis, acute.....	Simple.....	1	1		
Mastoiditis, meningitis, arthritis.....	Incision and drainage.....	1			1
Mastoiditis.....	Radical mastoid.....	2	2		
Do.....	Exenteration of mastoid.....	1	1		
Do.....	Simple mastoidectomy.....	1	1		
Do.....	Incision and curettage.....	1	1		
Necrosis of:					
Coccyx.....	Excision.....	1	1		
Femur.....	Osteotomy.....	1	1		
Do.....	Incision and drainage.....	1	1		
Finger.....	Amputation.....	10	10		
Do.....	Incision and curettage.....	4	4		
Do.....	Excision of necrotic bone.....	3	3		
Foot.....	do.....	1	1		
Do.....	Incision, curettage, and packing.....	1	1		
Inferior maxillary.....	Removal of part of bone.....	2	2		
Do.....	Curettage.....	1	1		
Frontal bone.....	Incision and removal of cyst.....	1	1		
Hand.....	Excision necrotic bone.....	2	2		
Knee.....	Osteotomy.....	1	1		
Metatarsal.....	Curettage.....	2	2		
Rib.....	do.....	1	1		
Tibia.....	do.....	2	2		
Do.....	Osteotomy.....	2	2		
Do.....	Excision of necrotic bone.....	1	1		
Thumb.....	Curetted and sutured.....	1	1		
Do.....	Excision.....	1	1		
Toe.....	Amputation.....	2	2		
Nephritis, chronic, and cirrhosis of liver.....	Paracentesis abdominis.....	1	1		
Nephrolithiasis.....	Nephrotomy.....	1	1		
Do.....	Nephrectomy.....	2	2		
Neoplasm of rectum.....	Spec. excised for microscopic examination.....	1	1		
Obesity.....	Lipectomy.....	2	1		1
Overriding toes.....	Amputation.....	1	1		
Osteoma of os calcis.....	Excision.....	1	1		
Oophoritis, chronic.....	Ovariectomy (right).....				
Do.....	Ovariectomy (left).....	1	1		
Occlusion of tear ducts.....	Incision and dilatation.....	1	1		
Osteomyelitis, acute.....	Curettage and removal of dead bone.....	1	1		
Ankle.....	Incision and drainage.....	2	2		
Femur.....	Curettage.....	1	1		
Finger.....	Amputation.....	1	1		
Humerus.....	Curettage.....	3	3		
Do.....	Sequestrotomy.....	1	1		



TABLE 5.—*Surgical operations performed during the fiscal year 1918—Continued.*

Operation for—	Character and name of operation.	Number of cases.	Successful.	Unsuccessful.	Died.
Ostomyelitis, acute—Continued.					
Mandible.....	Incision and curettage.....	1	1	.....	.....
Patella.....	Removal of upper part.....	1	1	.....	.....
Tibia.....	Osteoplastic repair.....	3	3	.....	.....
Do.....	Trephine and drainage.....	2	1	.....	1
Toe.....	Subperiosteal excision.....	1	1	.....	.....
Do.....	Incision and curettage.....	1	1	.....	.....
Do.....	Amputation.....	1	1	.....	.....
Otitis media.....	Mastoidectomy.....	1	1	.....	.....
Do.....	Paracentesis, drum.....	2	2	.....	.....
Do.....	Submucous resection of nasal septum.....	1	1	.....	.....
Do.....	Incision.....	1	1	.....	.....
Do.....	Incision and drainage.....	1	1	.....	.....
Otitis, chronic.....	Incision and curettage.....	1	1	.....	.....
Otitis, mastoiditis, acute.....	Radical mastoid.....	1	.....	.....	1
Operation wound.....	Repair.....	1	1	.....	.....
Fistula, gall bladder.....	Excision of fistulous tract.....	1	.....	1	.....
Do.....	Cholecystotomy.....	1	.....	.....	1
Bubo.....	Abscess opened.....	1	1	.....	.....
Finger.....	Amputation.....	1	1	.....	.....
Pneumonia, lobar, empyema.....	Thoracotomy.....	3	3	.....	.....
Paraphimosis.....	Dorsal incision.....	3	2	1	.....
Do.....	Circumcision and cautery.....	4	4	.....	.....
Do.....	Circumcision.....	20	20	.....	.....
Phimosis.....	Circumcision and cautery.....	26	26	.....	.....
Do.....	Dorsal incision.....	12	12	.....	.....
Do.....	Circumcision.....	126	126	.....	.....
Phimosis and hemorrhoids.....	Circumcision and excision of hemorrhoids.....	1	1	.....	.....
Paronychia.....	Incision.....	3	3	.....	.....
Periostitis:					
Hand.....	Transplantation of tendons, erosion metacarpal bones.....	1	1	.....	.....
Knee.....	Forcible extension.....	1	.....	1	.....
Tibia.....	Osteotomy.....	1	1	.....	.....
Chronic.....	Incision and drainage.....	1	1	.....	.....
Pterygium.....	Excision.....	2	2	.....	.....
Do.....	Transplantation.....	1	1	.....	.....
Peritonitis:					
Tuberculous.....	Incision and drainage.....	1	1	.....	.....
Acute, local.....	Drainage.....	1	1	.....	.....
Pes planus.....	Excision and tenotomy.....	1	1	.....	.....
Do.....	Correction and cast.....	1	1	.....	.....
Polypus:					
Nasal.....	Excision.....	11	11	.....	.....
Do.....	Excision left middle turbinate.....	1	1	.....	.....
Do.....	Excision right middle turbinate.....	1	1	.....	.....
Prolapse of rectum.....	Whitehead operation.....	2	2	.....	.....
Pleurisy:					
Suppurative.....	Thoracotomy.....	3	3	.....	.....
Do.....	Resection and insertion of tube.....	4	4	.....	.....
Effusion.....	Paracentesis thoracis.....	5	2	3	.....
Sero-fibrinous.....	Aspiration.....	2	2	.....	.....
Prostatitis.....	Prostatectomy.....	1	1	.....	.....
Pus in antrum.....	Sinus opened and drained.....	2	2	.....	.....
Papilloma of.....	Excision.....	1	1	.....	.....
Penis, multiple.....	Excision and cauterization.....	2	2	.....	.....
Lip.....	Excision.....	2	2	.....	.....
Pharyngitis.....	Uvulotomy.....	1	1	.....	.....
Elongated uvula.....	Clipping of uvula.....	1	1	.....	.....
Pyelitis.....	Nephrectomy.....	2	2	.....	.....
Paralysis of finger.....	Amputation.....	1	1	.....	.....
Panophthalmitis.....	Enucleation.....	2	2	.....	.....
Phlebitis, saphenous vein.....	Resection.....	1	1	.....	.....
Pyopneumothorax.....	Resection of rib.....	1	1	.....	.....
Pyonephrosis.....	Removal of left kidney.....	1	1	.....	.....
Do.....	Drainage and nephrotomy.....	1	1	.....	.....
Redundant prepuce.....	Circumcision.....	58	58	.....	.....
Do.....	Circumcision and cautery.....	4	4	.....	.....
Retention of urine.....	Suprapubic cystotomy.....	1	1	.....	.....
Rhinitis:					
Hypertrophic.....	Submucous resection.....	2	2	.....	.....
Subacute.....	Cauterization right infected turbinate.....	1	1	.....	.....
Rupture of urethra.....	External urethrotomy.....	2	2	.....	.....
Rheumatism, chronic.....	Neodiarsenol.....	1	1	.....	.....
Salpingitis.....	Bilateral salpingo-oophorectomy.....	1	1	.....	.....
Salpingitis, chronic.....	Dilatation and curettage.....	1	1	.....	.....
Sinus:					
Axilla.....	Incision and drainage.....	1	1	.....	.....
Bladder.....	Excision.....	1	1	.....	.....
Buttock.....	do.....	1	1	.....	.....

TABLE 5.—*Surgical operations performed during the fiscal year 1918—Continued.*

Operation for—	Character and name of operation.	Num-ber of cases.	Suc-cess-ful.	Unsuc-cess-ful.	Died.
Sinus—Continued.					
Frontal.....	Drainage.....	1	1		
Femur.....	Removal of plate.....	1	1		
Groin.....	Excision and suture.....	1	1		
Hand.....	Curettage.....	1	1		
Inguinal.....	do.....	1	1		
Leg.....	Curetted and drained.....	1	1		
Maxillary.....	Exploration and drainage of antrum.....	1	1		
Post occipital.....	Plastic.....	1	1		
Stricture of urethra.....	Perineal resection.....	1	1		
Do.....	Internal urethrotomy.....	7	7		
Do.....	Dilatation.....	3	2	1	
Do.....	Aspiration of bladder.....	1	1		
Do.....	External urethrotomy.....	3	3		
Do.....	Meatotomy and dilatation.....	1	1		
Do.....	Cystotomy and sounds passed.....	1	1		
Synovitis:					
Knee.....	Aspiration of joint.....	2	2		
Do.....	Incision and irrigation.....	1	1		
Sarcoma of:					
Chest wall.....	Excision.....	1	1		
Buttock.....	Exploratory incision.....	1	1		
Stump.....	Repair.....	3	3		
Do.....	Amputation.....	3	3		
Do.....	Excision of neuroma.....	1	1		
Do.....	Excision of scar tissue.....	1	1		
Sinusitis, ethmoidal, suppurative.....	Exenteration of each sinus.....	1	1		
Sprain of:					
Knee.....	Exploratory incision.....	1	1		
Do.....	Strapped.....	1	1		
Ankle.....	do.....	1	1		
Suppurative inguinal glands.....	Dissection.....	1	1		
Spinal cord laceration and contu-sion.....	Laminectomy.....	1			1
Syphilis:					
Aorta.....	Arsenobenzol.....	6	6		
Coraco-brachialis.....	Excision.....	1	1		
Eyes.....	Neodiarsenol.....	1	1		
Leg.....	Resection of tumor.....	1	1		
Lip.....	Arsenobenzol.....	2	2		
Do.....	Salvarsan.....	2	2		
Liver.....	Gall bladder drained.....	1	1		
Larynx.....	Neodiarsenol and neosalvarsan.....	6	6		
Lymph nodes, inguinal.....	Diarsenol.....	1	1		
Do.....	Excision.....	5	5		
Mouth.....	Salvarsan.....	2	2		
Penis.....	do.....	24	24		
Do.....	Neodiarsenol.....	11	11		
Do.....	Cauterization of growth.....	1		1	
Penis and testicles.....	Injection of neosalvarsan.....	6	6		
Skin.....	Arsphenamine.....	2		2	
Do.....	Injection of neosalvarsan.....	7	7		
Do.....	Diarsenol.....	7	7		
Do.....	Neosalvarsan.....	14	14		
Spinal nerve.....	Arsenobenzol.....	2	2		
Testicles.....	Castration one side.....	1	1		
Throat.....	Salvarsan.....	1	1		
Do.....	Arsenobenzol.....	2	2		
Tonsils.....	Neodiarsenol.....	1	1		
General.....	Arsenobenzol.....	58	58		
Do.....	Neodiarsenol.....	186	186		
Do.....	Salvarsan.....	214	214		
Do.....	Neosalvarsan.....	5	5		
Do.....	Arsphenamine.....	8	8		
Do.....	Excision inguinal glands.....	1	1		
Tuberculosis of:					
Ankle.....	Curettage and suture.....	1	1		
Elbow.....	Resection of joint.....	1	1		
Epididymis.....	Castration.....	2	2		
Head of ulna.....	Sinus cauterized and incision and curettage.....	1	1		
Hip.....	Incised, curetted and drained.....	1	1		
Knee.....	Bone graft and fixation.....	1	1		
Do.....	Aspiration and injection of glycerine and formalin.....	2	2		
Do.....	Osgood excision of joint.....	1	1		
Do.....	Curettement and granulation.....	1	1		
Do.....	Abscess incised.....	1	1		
Do.....	Amputation middle thigh.....	1	1		
Leg.....	Amputation.....	1	1		

TABLE 5.—*Surgical operations performed during the fiscal year 1918—Continued.*

Operation for—	Character and name of operation.	Num- ber of cases.	Suc- cess- ful.	Unsuc- cess- ful.	Died.
<b>Tuberculosis—Continued.</b>					
Lymph nodes.....	Excision.....	2	2		
Do.....	Curettage.....	1	1		
Do.....	Incision and drainage.....	4	4		
Peritoneum.....	Laparotomy.....	1			1
Second metacarpal joint.....	Aspiration.....	1		1	
Do.....	Curettage.....	2	1	1	
Do.....	Incision and drainage.....	1	1		
Sternum.....	Removal of bone and drainage.....	1	1		
Do.....	Incision and drainage.....	1	1		
Testicle.....	Salvarsan, intravenous.....				
Do.....	Castration, one side.....				
Sartorial bursa and left tibia.....	Excision of bursa and curettage.....	1	1		
Typhoid infection of costal cartilage:	Excision and drainage.....	1	1		
Tubercular glands of neck.....	Arsphenamine.....	2	2		
Tabes dorsalis.....	Neosalvarsan.....	5	5		
Tonsillitis.....	Tonsillectomy.....	21	21		
Torticollis, congenital.....	Tenotomy (cast applied).....	1	1		
<b>Tenosynovitis:</b>					
Finger.....	Incision.....	1	1		
Do.....	Incision and drainage.....	1	1		
Hand.....	do.....	1	1		
<b>Tumor of:</b>					
Breast.....	Excision.....	1	1		
Brain.....	Decompression.....	2	1		1
Ear, benign.....	Excision.....	1	1		
Face.....	do.....	1	1		
Neck.....	do.....	4	4		
Head and thigh.....	do.....	1	1		
Hand, benign.....	do.....	1	1		
Scalp.....	do.....	1	1		
Scalp, melanotic.....	do.....	1	1		
Sclera.....	do.....	1	1		
Testicle, benign.....	Castration, left.....	1	1		
Thigh.....	Excision.....	1	1		
Undescended testicle and hernia.....	Castration and herniotomy.....	1	1		
<b>Ulcers:</b>					
Cornea.....	Cauterization.....	2	2		
Duodenum.....	Post gastro-enterostomy and release of adhesions.....	1	1		
Do.....	Gastro-enterostomy.....	3	3		
Duodenum, perforating.....	Suture and drainage.....	1	1		
Gastric.....	Gastro-enterostomy.....	1	1		
Gastric, perforated.....	Repair and gastro-enterostomy.....	1			1
Leg.....	Skin graft.....	4	3	1	
Do.....	Excision.....	2	2		
Do.....	Excision of necrosed bone.....	1		1	
Do.....	Incision, curettage, suture.....	1	1		
Skin.....	Skin graft.....	3	3		
Skin, of heel.....	Skin graft (Reverdin).....	1	1		
Stomach.....	Gastro-enterostomy.....	4	4		
Do.....	Incision and drainage.....	2	2		
Do.....	Post gastro-enterostomy.....	7	6		1
Do.....	Partial gastrectomy.....	1	1		
Stomach, perforated.....	Post gastro-enterostomy.....	1	1		
<b>Varicocele</b>	Ligation and excision.....	26	26		
Do.....	Removal of pampiniform plexus.....	2	2		
Do.....	Excision.....	23	23		
Do.....	Prophylactic herniotomy.....	2	2		
Do.....	Vasectomy.....	18	18		
<b>Varicocele of scrotum</b>	Excision.....	1	1		
<b>Varix:</b>					
Epigastric, superficial.....	Arsenobenzol.....	3	3		
Leg.....	Excision and ligation.....	9	9		
Do.....	Excision.....	6	6		
Do.....	Resection.....	3	3		
Saphenous vein.....	Excision.....	7	7		
Do.....	Modified schode.....	1	1		
Do.....	Multiple ligature.....	6	6		
Do.....	Mayo.....	35	35		
Venereal warts.....	Excision and cautery.....	6	6		
<b>Wounds, gunshot:</b>					
Buttock.....	Incision.....	1	1		
Eye.....	Removal of shot.....	1	1		
Hand.....	Repair operation.....	1	1		
Do.....	Removal of shattered bone.....	1	1		
Do.....	Amputation 2 fingers.....	1	1		
Head.....	Decompression and bone transplan- tation.....	1	1		
Foot.....	Repair and amputation 2 toes.....	1	1		

TABLE 5.—Surgical operations performed during the fiscal year 1918—Continued.

Operation for—	Character and name of operation.	Number of cases.	Successful.	Unsuccessful.	Died.
Wounds, gunshot—Continued.					
Leg.....	Probed and sutured.....	2	2		
Scalp.....	Removal of bullet.....	1	1		
Shoulder.....	Probed and sutured.....	2	2		
Wounds, infected:					
Abdomen.....	Plastic and drainage.....	1	1		
Finger.....	Incision and drainage.....	3	3		
Hand.....	Incision.....	3	3		
Do.....	Incision and drainage.....	4	4		
Knee joint.....	do.....	1	1		
Thumb.....	do.....	2	2		
Wounds, incised:					
Abdominal wall.....	Curetted and sutured.....	1	1		
Ear.....	Suture.....	1	1		
Eye.....	Enucleation.....	1	1		
Finger.....	Suture.....	4	4		
Forearm.....	do.....	4	4		
Hand.....	do.....	5	5		
Do.....	Tendon repair.....	1	1		
Leg.....	Suture.....	2	2		
Muscles.....	do.....	2	2		
Neck.....	do.....	1	1		
Scalp.....	do.....	4	4		
Tendon.....	do.....	3	3		
Throat.....	do.....	1	1		
Wounds, lacerated:					
Abdomen.....	Removal of foreign objects, sutured.....	1	1		
Arm.....	Suture.....	1	1		
Axilla.....	do.....	1	1		
Ear.....	do.....	1	1		
Eye.....	Excision-prolapse of iris.....	1		1	
Eyelid.....	Suture.....	1	1		
Face.....	do.....	8	8		
Do.....	Plastic repair.....	1	1		
Do.....	Incision and drainage.....	3	3		
Finger.....	Amputation.....	11	11		
Do.....	Edges approximated.....	1	1		
Do.....	Incision and drainage.....	7	7		
Do.....	Nail removed.....	1	1		
Foot.....	Amputation.....	1	1		
Do.....	Incision and drainage.....	2	2		
Hand.....	Suture.....	6	6		
Do.....	Incision and drainage.....	1	1		
Leg.....	Suture.....	2	2		
Do.....	Incision and drainage.....	2	2		
Do.....	Amputation.....	1	1		
Scalp.....	Suture.....	8	8		
Thumb.....	Amputation.....	2	2		
Toe.....	do.....	1	1		
Do.....	Removal of nail.....	2	2		
Do.....	Suture.....	1	1		
Wounds, punctured:					
Arm.....	Incision and drainage.....	1	1		
Face.....	do.....	1	1		
Do.....	Ligation and suture.....	2	2		
Face, and fracture both maxillaries.	Sutured, packed and fracture reduced.....	1			1
Finger.....	Incision.....	1	1		
Do.....	Incision and drainage.....	5	5		
Foot.....	Cauterization with phenol.....	1	1		
Do.....	Incision and drainage.....	4	4		
Wounds, stab:					
Chest and abdomen.....	Suture and drainage.....	1	1		
Multiple.....	Suture.....	1	1		
Wounds, unclassified:					
Trachea.....	Removal of granulation tissue and suture of trachea.....	1	1		
Warts.....	Excision.....	3	3		
Total.....		3,917	3,821	37	59

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